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A Study on Information Technology Consumerization: Intentions to Use and Recognize Use Behaviors

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A STUDY ON INFORMATION TECHNOLOGY CONSUMERIZATION: INTENTIONS TO USE AND RECOGNIZING USE BEHAVIORS

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DEDICATION / ACKNOWLEGEMENT

Many thanks to my parents, Yvonne and Thomas Salmoni, their constant encouragement and support throughout this process were critical to my success. I dedicate my research to my daughters, Catherine and Sarah Lamb, with the hope they too will seek out experiences that will expand their thinking and grow their plans for future successes.

ABSTRACT

A STUDY ON INFORMATION TECHNOLOGY CONSUMERIZATION:
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The paper examines the influences of users' beliefs, attitudes, social norms, and perceived control on IT Consumerization use in the technology industry. It was expected to find significant influences leading to intention to use and actual use of the consumerization service. By identifying key drivers that lead to actual use, more was understood as to how to successfully position the service within an organization in such a way so as to connect the employee's interest to using an IT Consumerization service. In addition, the academic field of research is expanded by leveraging a well-grounded theoretical framework and an exploration of actual use of IT Consumerization into the current research stream. Data was gathered via electronic survey, including both pre-testing and pilot testing before data collection. Relationships between variables were assessed via structural equation modeling. Overall, the anticipated results continued to provide support to the Theory of Planned Behavior and probed actual use as a measure of the Nature of Use construct. The results were projected to demonstrate relationship support for the referenced attributes and some hypotheses which confirmed an impact upon behavioral intention to use and actual use.

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CHAPTER 1

INTRODUCTION

Recently, the network news shared that President Obama vocalized his preference for using his personal Smart Phone. He did not want to be mandated to a particular technology in his work role. (ABC News, *The Note*, on March 21, 2014). Even the POTUS (the President of the United States) has a personal technology preference in the workplace, and most individuals appreciate the fact that they can keep their favorite device always close at hand. The goal of the research project was to take a closer look at IT Consumerization services from an employee perspective and to gain an understanding of employee intention to use the IT Consumerization service on his/her personal device when the service is made available by the employer.

A personal device can be an individual's smartphone, tablet, or laptop where minimal operating system (OS) restrictions affect the ability to access various applications and services. An individual who is selecting a device for personal use will most likely have more options to choose from as a general consumer versus as an employee selecting a device for use in the workforce. The employer's offering may be limited because they are based on vendor agreements, supporting architecture, and other relative limitations. Recent studies examined the use of personal technology in the workplace, which combined a variety of theories and frameworks for evaluating a device and for application use.

Information technology (IT) consumerization is the use of employee-purchased devices to access employer applications, remotely or at an employer's location, to

perform employee work-related tasks to create, update, manage, or to use corporate data (Loose, Weeger, & Gewald , 2013; Niehaves, Koeffer, & Ortbach, 2012; Ortbach, Koeffer, Bode, & Niehaves, 2013b). For example, an employee-owned device most likely was or will be selected from the perspective of a consumer rather than that of an employee. While prior research often presented IT consumerization as part of a research model in which the goal was to explain behavioral intention to use (Dernbecher, Beck & Weber, 2013; Lebek et al., 2013; Ortbach et al., 2013b), this research examined some additional factors that influence individuals' intention to use and ultimately their actual use of IT Consumerization.

Perceiving the decision to use an application or service from a personal device as a consumer choice, along with the consideration of existing research on consumer-buying intentions, three areas appeared to be related to IT Consumerization: service quality, personal interest in the product (what the product perceptions are), and repeat buying behaviors. These consumer behaviors inspired the strategy for the approach to this IT Consumerization research project by translating these ideas into the following perceptions: 1) service quality delivered by the IT Department; 2) personal innovativeness of the employee: and ultimately, 3) demonstrated use of the IT Consumerization service.

If an employer offers a service via an application to allow an employee to use his/her favorite tablet or device to update/review time cards, submit expense reports, or research budget planning details, then perhaps the employee would be interested in IT Consumerization as that service. Such interest would result from the option to use a device that is both familiar and comfortable for the accomplishment of work tasks.

Employers who offer IT Consumerization would most likely encourage interested employees to use the service.

The potential outcome for organizations which promote this service solution would be the elimination of a portion of hardware costs. If an organization is able to manage risks, assure corporate security, and encourage employees to perform additional tasks beyond the standard eight-hour work day, the service would appear to be a sound investment. Employees who are willing to try IT Consumerization as a service may get into the habit of using it and thereby set the workplace norm for future employees to use this solution.

IT Consumerization is similar to the idea of "Bring Your Own Device," also known as B.Y.O.D (Garcia & Silva, 2013; Lebek, Degirmenci, & Breitner, 2013). The various terms that described the emerging phenomenon of IT Consumerization are provided in Table 1.1, in which the options demonstrate a progression from a specific device (UWYT) to a service option (ITC) with corresponding increases in the governance, support model, and related risks for the corporation (Singh, 2012). IT Consumerization is recognized to be more technically complex and thus requires greater corporate governance. Users of IT Consumerization applications and services perceive related risks in security and privacy (Lebek et al. 2013; Miller, Voas, Hurlburt, 2012; Wang & Wu, 2005). Nonetheless many companies including Hewlett Packard, Dell, Iron Mountain, IBM, and AT&T have already provisioned IT Consumerization as a service available to their employees (Ellis, Saret, and Weed, 2012).

Table 1.1: Acronyms found in the Research Stream

Acronym	Terminology	Scenario of Use Description
UWYT	Use What You're Told	Employer identifies specific hardware that an employee can use in the workplace to access specific applications. Singh, 2012
BYOT	Bring Your Own Technology	At the employee's workplace location, any personal device that can access a file server within the employer's infrastructure. Pegrum et al., 2012
BYOD	Bring Your Own Device	The consolidation of personal and corporate productivity tools (specific device – WAP: Wireless enabled Protocol) into a single device used in performing enterprise application work-related tasks. Niehaves et al., 2012
ITC	Information Technology Consumerization	IT Consumerization is the use of a personal device to access a service (remote or at the work) which allows the user to complete employee work-related tasks including activities which create, update, and manage corporate data. A personal device can be an employee's smartphone, tablet, or laptop with only minimal operating system restrictions. Ortbach et al., 2013

With IT Consumerization increasingly offered as a service in the workplace, employees have the opportunity to make a consumer-related choice regarding his/her intention to use IT Consumerization. Research planning for this project began with the consideration that an employee's interest in the service could parallel a consumer's interest inherent in the initial selection of their personal device. If the service were available, then what would generate consumer-intention toward use? What would prompt an employee to have an attitude of interest or disinterest toward IT consumerization? If IT consumerization is a service offered to the employee by his/her employer, then what factors encourage intention to use and actual use of the service?

IT Consumerization Service has evolved over time, beginning with providing the employee access to work-related applications from a remote location via corporate-owned technology. Remote location access then progressed into the IT Consumerization service phenomenon available through personal devices now having similar access as do corporate-owned devices. When the constraint of corporate device requirements was

removed and designed as an application service, it can be leveraged from an employee's personal device. A variety of efforts have progressively examined remote access, which could be considered a forerunner to IT Consumerization services research and development (Anderson & Agarwal, 2010; Lyytinen & Yoo, 2002; Warkentin, Johnston, & Shropshire, 2011).

IT Consumerization has been receiving attention from both academics and practitioners alike because researchers and consultants seek to understand determinants that lead to the use of consumer-owned devices for work-related tasks (Singh, 2012; Weiss & Leimeister, 2012). Information Systems (IS) research has recently examined this topic by introducing and discussing IT Consumerization through panel discussions (e.g., Shim, Mittleman, Welke, French, & Guo, 2013), as well as in conference proceedings (e.g., Lee, Crossler, & Warkentin, 2013). Proceedings and conferences, such as the Americas Conference on Information Systems (AMCIS) and the International Conference on Information Systems (ICIS), have provided the opportunity for academic discussion and encouraged further research into this emerging topic (Dernbecher et al., 2013; Ortbach, Bode and Niehaves, 2013a; Niehaves et al., 2012).

This study captures how the advantages and disadvantages for the employee can impact the choice to adopt IT consumerization as a service. Niehaves, Koeffer, and Ortbach (2012) identified a framework of IT Consumerization which includes advantages and disadvantages for both individual employees and organizations. The primary advantages for organizations include: employee satisfaction, speed of application adoption, employee availability, customer focus, and employee investments. The advantages for the employee were identified as autonomy, motivation, and ease of

adoption. The disadvantages for the employee were identified as increased work-related stress and an increase in work load, while organizational concerns include apprehension about security, support complexity, loss of process control, and performance concerns (Niehaves et al., 2012).

Table 1.2: IT Consumerization from the Employee and the Organizational Perspective (Niehaves et al., 2012)

	Advantages	Disadvantages
Employee	Autonomy (11) Motivation (9) Ease of adoption (8)	Increase in workload (5) Stress (5)
Organization	Employee satisfaction (17) Speed of adoption (14) Employee availability (10) Customer focus (6) Employee investments (5)	Security issues (21) Support complexity (15) Loss of process control (12) Performance concerns (8)

Some researchers focused more on the individual employee and less on the organization. They have operationalized the employee's perceived advantage and disadvantage within a single study which includes perceived benefits and improved performance as advantages (Lebek et al., 2013; Loose, et al., 2013), while they considered threats and other negative concerns related to privacy within the same research model. These models seem to have a "net advantage-disadvantage" aspect driving the intention to use IT Consumerization services.

Organizations have considered the requirements necessary to support multiple types of devices as a disadvantage because the support to be delivered becomes progressively more complex (Niehaves et al., 2012). This example illustrates an organizational disadvantage which is created as a result of technology support complexity upon implementation of an IT Consumerization strategy. The authors of this IT

Consumerization study looked at this same organizational disadvantage from an individual user's perspective. The user's behavioral intention to use may be affected by the perception of the service quality associated with the IT department.

In addition to the advantage of perceived performance improvements, this study included other attributes, such as the idea of personal innovativeness as a characteristic of the individual employee. The attitude of the potential users and social norms about the service were examined as influences upon intentions to use leading to actual use.

This research model presented actual use as the final dependent variable. For this study, the hope was to gain insight as to whether or not actual use is demonstrated by the IT Consumerization Service system users and if it stems from the intention to use. Companies that invest in the strategy are now spending time, money, and other resources to implement the service with an expectation of gaining more than just a few adopters (Ellis, Saret, & Weed, 2012; Singh, 2012; Weiss & Leimeister, 2012). This trend for corporations to provide the IT Consumerization Service with hopes of reducing capital-spending on hardware-related assets and improving employee productivity is an investment perception that has a potential to be realized (Baskerville, 2011).

By considering the Nature of Use construct (Jain & Kanungo, 2005) which for this study is the selection of hardware and applications, the project anticipates providing additional information confirming use beyond general use (yes/no survey design indicator). Having a deeper understanding of how the service was used, and confirming use which goes beyond just logging into the service or merely registering the device to use the service, the hope was to add to the field of research by providing more

understanding about actual use and how to drive improvements for increasing subscribership.

The present study seeks to discover more about use by probing into what was experienced through the types of transactions (the Nature of Use construct) performed within the application via the IT Consumerization service. The following research questions (RQ) were addressed and expanded upon from some of the more recent models of IT Consumerization use:

RQ1: Will perceptions related to service quality, specifically IT Department empathy and IT Department support influence the employee's intention to use an IT Consumerization solution in the workplace?

RQ2: Will personal innovativeness moderate the relationship between the attitude toward intention to use and behavioral intention to use an IT Consumerization Service provided by the employer?

RQ3: Will intentions to use IT Consumerization services lead to actual use as represented by hardware and application selection?

These research questions are important as an extension of the existing research stream in that they recognize the need to include familiar elements from the technology use field of research. They also identify the importance of a sound theoretical underpinning and offer a framework for the exploration of a deeper understanding of use. The inclusion of the service quality attribute is often found in the IS adoption and technology use research (DeLone & McLean, 1992: Petter, DeLone, & McLean, 2013); therefore, it is reasonable to believe that service quality will have a similar influence upon the IT Consumerization phenomenon. Personal innovativeness is often found as a common characteristic of early adopters (Agarwal & Prasad, 1998). The research model proposed that this variable be positioned as a moderator in an effort to further investigate the attitude of the users who may have an intention to use IT Consumerization Services.

For this study, the project considered the development of beliefs and attitudes that drive the intention to use as part of a cognitive decision-making process which precedes behavioral intention and exists prior to the corresponding behavior being performed or displayed (Ajzen, 1991; Mathieson, 1991; Taylor & Todd, 1995). The voluntary nature of an optional service which is available to employees is introduced in the IT Consumerization research stream as an attribute that deserves consideration as an influence upon intention in and of itself (Moore & Benbasat, 1991; Venkatesh, Thong, & Xu, 2012). Finally, in an effort to take a deeper look at the use of the IT Consumerization Service, the measure for the nature of the use was based on self-report from employees who are currently using the service (Ahuja & Thatcher, 2005; Jain & Kanungo, 2005).

The scope of the study targeted organizations in the technology industry. Technology users were current employees with companies where IT Consumerization is already present and available. Device options included smartphones, tablets, and laptops. The study assessed user perceptions relating to performance expectancy, behaviors of co-workers, privacy, service quality, voluntariness, and personal innovativeness upon intention to use IT Consumerization. The intention to use IT Consumerization is examined as an effect upon use behaviors measured by the Nature of Use construct. The study was limited to a single industry with relatively few target companies where IT Consumerization is already delivering this voluntary technology strategy for employees. The paper provides a literature review, methodology assessment, results and analyses, discussion, and future research opportunities in response to the research questions.

CHAPTER 2

LITERATURE REVIEW

The phenomenon of IT Consumerization has recently been positioned in the academic research arena as a voluntary, mobile service solution provided by the employer to the employee as a technology use option in the workplace (Garcia & Silva, 2013; Weiss & Leimeister, 2013). IT Consumerization is defined by practitioners as a mobility service which focuses upon access to enterprise applications via a personal device and which is often associated with benefits and advantages for end users and their organizations (Ellis et al., 2012; Weiss and Leimeister, 2013; Singh, 2012). Past research has clearly indicated that potential system users will have both perceived beliefs and/or attitudes associated with the decision to use technology (Ajzen, 1991; Davis, 1989; Moore & Benbasat, 1991; Taylor & Todd, 1991; Venkatesh et al., 2003). It is from this perspective of the user's beliefs and attitudes toward a technology offering, along with the proposed relationships revolving around these ideas that this literature review begins. The literature review was presented in three parts: Part One, which consists of the theoretical framework; Part Two, which is a conceptualization of constructs; and Part Three, which provides the hypotheses development supporting the research model.

Part One of this literature review is a discussion of the theoretical framework, or the Theory of Planned Behavior (TPB), which is used to understand the phenomenon of IT Consumerization. It begins with a focus on the theoretical framework's functional description, which includes attributes and characteristics. TPB will be compared with other commonly identified theories found in the domain of technology use in order to

explain why TPB was selected for this research project. A diagram will illustrate the TPB framework was diagrammed as a theoretical foundation for the research project. The theoretical model provided support for both the conceptual and operational models used to study the influences impacting IT Consumerization intention to use.

Part Two of the literature review includes a conceptualization of the IT Consumerization service and is presented in parallel to other similar studies of mobility services technology use. The comparison with IS mobility use studies acts as a mechanism for identifying other potential relationships among the IT Consumerization constructs. It supports service use relationships similar to those revealed in studies of mobile use.

The final section, Part Three of the literature review, develops the IT Consumerization operational model. The model presents the selected constructs in conjunction with the associated hypotheses. These hypotheses were developed based upon existing empirical studies within the field of IT Consumerization research.

Part One: Theoretical Framework - Theory of Planned Behavior

The main premise behind the TPB (Figure 2.1) was to gain an understanding of predictable behavior by moving away from a broad generalization of common attitudes or beliefs and develop a deeper understanding of actual behaviors by combining a range of beliefs and perceptions which focus upon a specific set of conditions (Ajzen, 1991). Researchers in the area of behavioral predictions originally considered actual behavior as an aggregation of normative beliefs and developed the Theory of Reasoned Action (TRA). They recognized that behavioral intentions are formed by the culmination of

subjective norms, attitudes, and beliefs toward the specific condition and in relation to a particular event or scenario (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

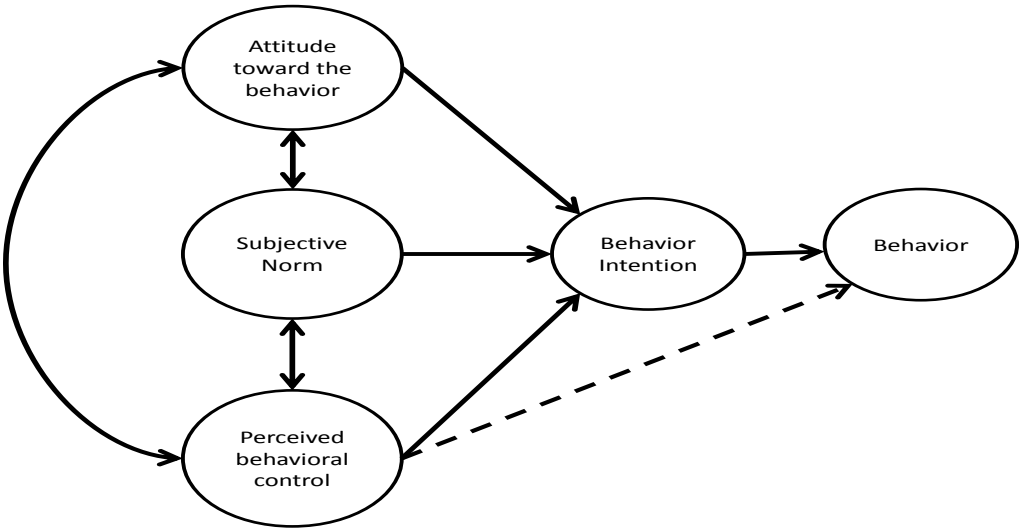

Figure 2.1: Theory of Planned Behavior (Ajzen, 1991)

TPB (Ajzen 1985, 1991) is an expansion of the Theory of Reasoned Action (Fishbein and Ajzen, 1974) which expands the framework of TRA through the inclusion of perceived behavioral control (Ajzen, 1991) and provides researchers with the opportunity to further explain decisions which lead to actual behaviors. Perceived behavioral control is an individual's beliefs about inputs or influences associated with his/her decision to use that may impact the outcome as either a success or a failure. Perceived behavioral control is not an observation based on one's own abilities (Taylor & Todd, 1995) nor is it a locus of control; therefore, behavioral intention research must consider outside influences that may or may not affect an individual's beliefs toward IT Consumerization.

When the perceived behavioral control construct is included as part of the assessment of behavioral intentions (Ajzen, 1991), TPB implies that the behavior results will be better understood because individual cognitive conditions are considered in relation to the decision-making process leading up to the actual behavior. Within the current IT Consumerization research stream, theoretical framework considerations include TPB, TRA, and the Technology Acceptance Model (TAM) as foundational elements for empirically assessing the phenomenon (Ortbach et al., 2013; Niehaves et al., 2012; Lebek et al., 2013). TAM is differentiated from TPB and TRA in that social influences and perceived behavioral controls are not taken into consideration (Taylor & Todd, 1995). Perceived behavioral controls are neither implicit nor explicit within the TAM studies due to the conditions in which the information system resides, i.e. in the workplace where mandatory work-related tasks are performed.

TAM was originally tested in work-related settings; however, identification of the mandatory and voluntary use characteristics which were identified were found to be ambiguous, with confusion between actual system use and the use of system-related outputs (Wu, 2012). Today, TAM is one of the most widely-used theoretical frameworks for technology use studies (Lee, Kozar, & Larsen, 2003; King & He, 2006; Wu, 2012). Although TAM proposes that the key perceptions related to use, i.e., perceived usefulness and perceived ease of use, are important to IS success research, these constructs are evaluating locus of control conditions. Locus of control and internal beliefs do not support either perceived behavioral control or social norms constructs, both of which are necessary attributes for the research model based in TPB.

Some researchers combine multiple theoretical frameworks to cover the combination of attributes; this approach is found within IT Consumerization and other Mobility Services research streams (Dernbecher et al., 2013; Kuo & Yen, 2009; Loose et al., 2013; Nysveen, Pedersen, & Thorbjørnsen, 2005; Wang, Lin, & Luarn, 2006). Researchers have compared these models to determine the explanatory power of each theory in the areas of intention to use and actual use of the technology (Mathieson, 1991; Taylor & Todd, 1995; Wu, 2012). From these comparative studies, it has been concluded that TAM has the greatest explanatory power with the most parsimonious model structure.

However, Ajzen (1991) notes that although the TPB and TAM are in agreement regarding the assessment of ease of use and its relationship to technology acceptance, TAM does not include a subjective norm as a social behavioral construct. This observation is important for some system researchers who have discovered that TAM constructs do not always predict actual use behavior (Manfredo & Shelby, 1988; Sharma, Yetton, & Crawford, 2004). The idea of a broader and deeper understanding of the complexity and changing accessibility for the use requirement may involve a more complex model. Therefore, incorporating social influences into a complex use model was one of the foundations of this study.

Mathieson (1991) completed a comparative study on predicting user intentions between TPB and TAM. He determined that TAM was easier to apply than TPB. On the other hand, he provided the observation that TPB is better for identify the complexity of the intention to use and actual use behaviors (Mathieson, 1991). Further academic understanding is gained about technology use behaviors by first distinguishing how

people decide to use and then determining the act whereby their thoughts are framed into behavioral intentions to use. Actual use behavior alone does not provide the details necessary for the researcher to identify which beliefs or attitudes influenced the users' original decision to use the available technology service (Benbasat & Barki, 2007; Wu, 2012; Mathieson, 1991; Moore & Benbasat, 1991). An examination of these phases of the thought process should provide additional insight into understanding the complexity of usage and continued usage.

Researchers have examined deep use and complex usage from a system user's perspective (Burton-Jones & Straub, 2006; Lamb & Kling, 2003; Marcolin, Compeau, Munro, & Huffs, 2001; Orlikowski & Iacona, 2001). These researchers have examined either deep usage, in which case a multi-level system of use occurs within an organization; or complex use, which occurs at the individual level within the system itself. Researchers who apply the structural perspective of organizational use advocate that use studies are best designed with all three areas combined. These areas include individual, group, and organizations with each area's perceptions being assessed in an effort to understand technology use success (Burton-Jones & Gallivan, 2007). The complexity of individual use and deep usage assessments are also seen in studies which examine post-adoption behaviors, an example of which includes studies focusing upon extended use, the use of multiple features, and motivational factors that influence continued use behaviors (Ahuja & Thatcher, 2005; Choi, Kim, & Kim, 2011; Hsieh & Wang, 2007).

Based upon the changing population of technology system users (i.e. the diversity of consumers and employees), and the complex systems and technology solutions

available for use in our personal lives and in the workplace, a more complex theoretical model was necessary. Given the ubiquitous nature of technology in and of itself, the need for a deeper understanding of the actual use construct continues to be relevant to IS academic research (Straub, 2012). TPB is thus a strong framework for probing more deeply into the technology use construct. Identifying actual influences which are based upon conditional circumstances such as IT Consumerization, and determining their impact on the attitudes and behaviors of technology adopters can lead the academic community to a greater expansion of existing studies, as well as an exploration of innovations. The next section will focus upon the conceptualization of intention to use IT Consumerization in the workplace.

Part Two: Conceptual Framework of an IT Consumerization Service

In an effort to conceptualize IT Consumerization, the research drew upon employee IT Consumerization and consumer Mobility Services behavioral research streams for the recently observed attributes and relationships. It established a parallel for the relationships discovered between the consumer's behavioral intention to use mobility services and the employee's intention to use an IT Consumerization solution in the workplace. Finally, it created a conceptual foundation which supports the selected constructs and suggested relationships as depicted in the conceptual model (Figure 2.2). Each construct was described in relation to its conceptual development and contributed to the developed hypothesis and corresponding operational model.

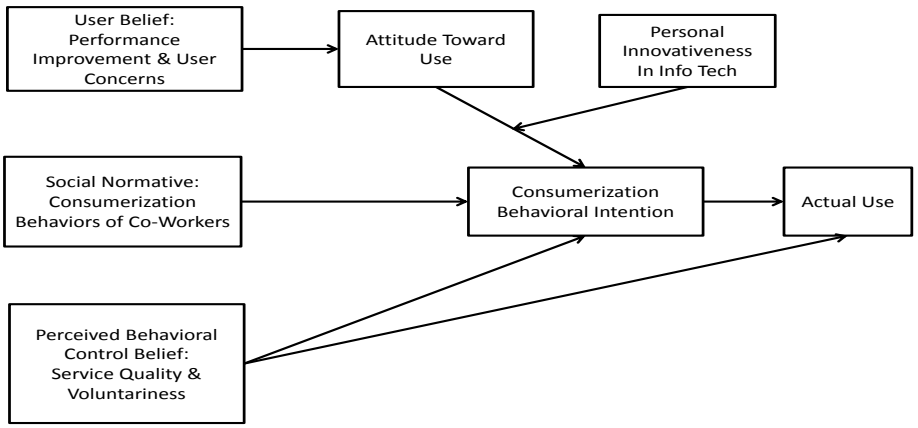

Figure 2.2: Conceptual Model of IT Consumerization

Part Two of the literature review includes references to the research on mobility services for two reasons. First, academic studies on IT Consumerization are only recently emerging in the field of IS research and are therefore somewhat limited. Second, IT Consumerization Services are similar to Mobility Services since both research streams are focused upon wireless device use that incorporates a wireless application protocol service. IT Consumerization and Mobility Services research includes devices such as smartphones, tablets, and laptops (Wang et al., 2006; Harris, Patten, Regan, & Fjermestad, 2012; Hung, Ku, & Chang, 2003; Loose et al., 2013). More importantly, both areas of research focus upon the individual as an autonomous user electing to use the service without mandated pressure to engage in the offering (Garcia & Silva, 2013, Nysveen et al., 2005, Wang et al., 2006).

Both fields of research are also designed with a similar focus upon the end user's perceptions of use and intention (Kleijnen, Wetzels, & Ruyter, 2004; Niehaves et al., 2012; Kuo & Yen, 2009). Therefore, the conjectures which demonstrate the constructs

were gleaned from both of these areas and applied to establish the conceptual framework. The purpose is to compare factors which influence behavioral intentions to use mobile services with those which are parallel to an employee's intentions to use IT Consumerization services (Table 2.1).

Table 2.1 Employees and Consumers Use of IT Services

Users Considering the Service	Service Being Offered
Consumers using a personal device with Internet and Mobile Application to perform personal tasks	Applications that promote use of e-commerce and m-commerce via a personal device.
Employees using personal device with the Intranet & Enterprise applications designed to perform work tasks	Application that support work tasks that can be accessed via a personal device or from a corporate-owned device

Mobility services and the consumer's intention to use include similar factors discovered in the IT Consumerization research. Some of the factors were identified as follows: potential advantages and potential disadvantages; the user's interest in innovation and social norms; perceptions of mobile service quality; and the user's perspective on voluntariness of the service. Research relevant to the conceptualization of potential advantages is presented with a focus upon perceived performance improvements.

Belief Toward a Potential Advantage

Potential advantages of mobility services include accessibility to services, reduction in wait and travel time and most often convenience (Nysveen et al., 2005; Harris et al., 2012; Kleijnen et al., 2003). For example, IT Consumerization research has found that employees have identified performance improvements as a perceived

expectation leading to the use of an IT Consumerization service in the workplace (Lebek et al., 2013; Loose, et al., 2013; Ortbach et al., 2013a). The employee who experiences perceived performance improvement sets a service expectation for other employees that his/her performance will be enhanced. Similar perceptions can be compared to the consumer's expectations toward mobility services.

In an effort to create a parallel with the construct associated with advantageous beliefs, a common cognitive similarity which seemingly exists between the consumer and the employee has been identified. When comparing the research streams on employee use and consumer use, the expectation that the individual will act as both consumer and employee led to the assumption that both roles would have an expectation that some type of beneficial improvement will be realized through the use of the service. The interpretation of the actual benefit or value associated with the technology may vary but the influence on the attitude toward the use intention and behavior intention will be authentic.

Belief Toward a Potential Disadvantage

A potential disadvantage evident in mobility services research pertains to privacy-related concerns, especially in the use of e-commerce and banking transactions via wireless communications (Luarn & Lin, 2005; Wang et al., 2006; Wu & Wang, 2005). Recent research in the area of IT Consumerization in the workplace has revealed similar concerns which relate to privacy and security. Other similar concerns were recognized as an influence upon both organizational interest in the strategy of IT Consumerization (Harris et al., 2012) and upon the employee, who by now may already have the option to use the service (Lee, Crossler, & Warkentin, 2013). However, before offering the

employee the option to use an IT Consumerization solution in the workplace, the employer will need to make important decisions with regards to governing the process, securing the related corporate assets associated with an IT Consumerization strategy, and achieving insight into the willingness of the employee to use the innovation.

Personal Innovativeness

In general, personal innovativeness might be described as the "excitement of trying something new". For this research, trying something "new" is using a personal wireless device to access a corporate application to complete work-related tasks. More specific descriptions and sophisticated research already exists with regard to personal innovative characteristics and behaviors. The development of the PIIT (Personal Innovativeness in IT) construct was established in an effort to identify the traits of early adopters of technology (Agarwal & Prasad, 1998). It was believed that highly innovative individuals could be exposed to various technological innovations, begin to use them, and consequently set the pace to broaden the consumer stream through the adaption of new users to the technology offering (Brancheau & Wetherbe, 1990). Those individuals who exhibited personal innovative traits were known as early adopters (Agarwal & Prasad, 1998).

Considering the recent research into factors that influence IT Consumerization, the personal innovativeness construct is a natural candidate since the use of a personal device with corporate applications is an innovation in of itself. The relationship that the PIIT construct has with other constructs identified in the behavioral intention to use models is currently evolving. Dernbecher, Beck, and Weber (2013) positions PIIT as an exogenous variable leading to habits. Other researchers place the PIIT variable as a

direct influence upon IT Consumerization intentions (Ortbach et al., 2013a). These researchers recognize the need to include the concept; however, operationalizing PIIT will require that additional literature be considered to determine the exact position of the construct in the operational model. Similar challenges for conceptualizing social influences into the conceptual model also exist.

Influence from Social Norms

Within the mobility services consumer research, the need to include social norms has been recognized, consistently defined, and accurately measured for their impact upon behavioral intention to use technology (Amoroso & Magnier-Watanabe, 2012; Kleijnen et al., 2004; Nysveen et al., 2005). Many of the mobility services consumer research models utilize the technology adoption studies for clarification of the results. Researchers demonstrated the application of normative beliefs and social normative beliefs which added justification for the inclusion of social influences in technology use research endeavors (Karahanna, Straub, & Chervany, 1999; Taylor & Todd, 1995; Venkatesh, Morris, Davis, & Davis, 2003). Group norms and social norms may vary based on the relative communication distance among the individuals (Rogers & Kincaid, 1981).

IT Consumerization research has also included the beliefs associated with social influences that may affect an individual's decision to use the service. Social normative behaviors are presented within this research as coming from co-workers, supervisors, and managers who may influence the employee's attitude toward behavioral intention to use (Dernbecher et al., 2013; Loose et al., 2013; Ortbach et al., 2013b). Employees in these same roles in the workplace may additionally be influenced by the perceived service

quality of the IT department in their positive support for an employee who is considering the use of the IT Consumerization service on his/her personal device.

Service Quality and Behavioral Control

IT Consumerization research has revealed factors that appears to be representative of service quality and which have indicators of explanatory power directed towards the behavioral intention to use research stream. Ortbach, Koeffer, Bode, and Niehaves (2013b) identified beliefs regarding technical support (usage and installation) attributes that do affect intention to use. However, in order to understand how service quality has been blended into IS research; we must consider consumer and marketing research on the topic. In early consumer research, the most widely used model for assessing service quality was developed by Parasuraman, Zeithaml, and Berry (1985). Their model provides the researcher with a method for evaluating service quality by examining the gap between the consumer's expectations and the perceptions of service performance.

Consumer and marketing service quality research in behavioral intention to use is often assessed in reference to SERVQUAL. This tool measures five dimensions of quality, including the following: reliability, assurances, tangibility, empathy, and responsiveness (Alexandris, Dimitriadis, & Markata, 2002). Within the field of consumer research, this model is sometimes criticized in regard to the ease of operationalization for use and the general weakness of the theoretical foundation (Buttle, 1996; Cronin & Taylor, 1992). The SERVQUAL model is leveraged by the intention to use research. In one particular study within the behavioral intention research stream, the researchers positioned behavioral intentions to use with the actual use behavior in order

to mediate the service quality and the corporate performance relationship within a financial organizational setting (Parasuraman, Zeithaml, & Berry, 1995).

The service quality construct is also found in the IS research from DeLone and McLean (1992) who identify the characteristics of service quality as attributes of the support which system users will receive from the IS organization or IT personnel. These attributes include responsiveness, accuracy, and reliability, as well as technical competence and empathy; these are very similar to the SERVQUAL dimensions. Although only minimal research in information systems reveals service quality as a predictor of use (Petter, DeLone, & McLean, 2008), the research may be positioned in relation to mandated work tasks in which case using the service would not be an option. In the case of IT Consumerization, the use of a personal device to perform work-related tasks is optional; therefore, service quality in this case would have more of an influence on the decision to use.

Researchers continue to see SERVQUAL dimensions referenced in the IS research stream. In a meta-analysis of IS related service quality, researchers discovered that IS website service quality research included the SERVQUAL dimensions in ten of the most recent contributions on the subject (Xu, Benbasat, & Cenfetelli, 2013). Mobility Services research also includes the examination of service quality attributes through the assessment of perceived provider credibility. Credibility refers to the capability to support the service should technical difficulties arise; the degree of credibility would therefore impact the behavioral intention to use (Luarn & Lin, 2005; Wang et al., 2006).

From the references within the present literature on service quality, the conceptualization for the inclusion of service quality in this research study was confirmed

as an appropriate construct for the model. Service quality is considered representative of the perceived behavioral control beliefs since the user cannot control the performance of the IT departmental resources. However, it may nonetheless influence the user's intention to use. One other construct which was part of the conceptual model and which was similarly considered was the user's belief about voluntariness.

Voluntary Use and Behavioral Control

Voluntariness is an individual's sense about having a choice and for this study asks the question: Is there another method (outside the mobility service) which allows me to finish or resolve the related task? Mobility Services, which are system services or related mobile applications available on a wireless device, promote consumer convenience, and are considered voluntary solutions. The mobile service provides voluntary applications and graphical user interfaces for such services as commerce, banking, and other related transactional services. Mobility Services also provide an alternate link between the consumer and supplier in support of the consumer/supplier relationship (Kleijnen et al., 2004; Nysveen et al., 2005; Wang et al., 2006). Consumers may choose to use these services via their personal devices, or they may make alternative arrangements for engaging and/or completing an applicable transaction with the supplier. An expansion of the use of the device to include the added service may result in continued use, which may be further realized as the technology becomes a dual use appliance (Bhattacharjee, 2001; Hong & Tam, 2006).

Table 2.2 provides a summary of construct comparisons made in the conceptual model. The data is derived from the literature review on IT Consumerization and Mobility Services, and is presented as a stepping stone toward the operationalization of

the model. The specific constructs are more explicitly defined in the section that follows and offer support for hypotheses development within the operational model, in conjunction with the prediction of anticipated influences.

Table 2.2 Comparison of Similar User Perceptions Toward Intention to Use

Systems Users Model Construct	Mobile Service Users	IT Consumerization Users
Perceived Advantage	Benefits in time savings, convenience, accessibility	Benefits in performance improvements & accessibility
Perceived Disadvantages	Loss or misuse of personal information	Loss or misuse of personal information
Social Normative	Influence from friends and family	Influence from peer and management
Perceived Behavioral Controls	The service is voluntary and other options are available	The service is voluntary and other options are available
Service Quality	The company will help me when I have problems completing the transaction	The IT Department will help me when I have problems completing the transaction

Part Three: Related Research and Hypotheses Development

The constructs in the conceptual model have been identified for this research study; however, in order to operationalize them within the model, a clear definition of each is provided below (Table 2.3). Additionally, each construct was discussed with regard to previous empirical studies found within the IT Consumerization literature. Each corresponding hypothesis which is presented follows the definitions and represents the operational relationships in the final research model.

Table 2.3: Constructs and Definitions

Construct	Definition
Privacy/Security Concerns	Employee belief that private and secured information on their personal device will be used inappropriately by the employer when IT Consumerization services are used.
Performance Improvement	Performance improvement is the belief that work tasks will be completed more effectively and with greater efficiency through the use of IT Consumerization services on a personal device.
Personal Innovativeness in Information Technology	Personal Innovativeness of Information Technology is the willingness of an employee to try out and adopt technology innovations in the early stages of availability.
Consumerization Behavior of Co-Workers	Directed by the employee's peer group perception, the pressure or persuasion experienced by the employee to use technology Consumerization services on a personal device.
Technology Support	Technical Support as a service quality that assures all devices will be supported by the company implementing the IT Consumerization service. Technical support is perceived as acceptable when users experience empathy and responsiveness when contacting the IT Department for support.
Consumerization Voluntariness	The use of the IT Consumerization is voluntary where employees have the option to participate and increase behavioral intention to use.
Attitude Intentions	Generated by related norms, perceived behavioral controls, and beliefs, the user's attitude intention is developed toward IT Consumerization service availability in the workplace.
Behavioral Intention to Use	Developed from the user's attitudes**,** behavioral intention is the intent to use the IT Consumerization service on a personal device(s) to complete work-related tasks.
Use of IT Consumerization	Driven by the behavioral intention of the user, use is the actual use of IT Consumerization Services on a personal device to complete enterprise application tasks in the workplace.

Privacy Concerns

In a study focused upon employee interest to use an IT Consumerization service, it was discovered that employees are concerned about their own personal information (Loose et al., 2013). Because the IT Consumerization service involves using the employee's personal device, the employer may have access to the employee's private

information. An employee's attitude toward the use of the service may be influenced by concerns for privacy, security, and the potential inappropriate use of personal information by the company.

Other related research identified similar employee concerns regarding the potential availability of personal information which becomes corporate information through the use of personal devices. Questions about responsibility, accessibility, and liability for potential personal data loss and security failures were raised (Ortbach et al., 2013b). Because these beliefs may impact the employee's attitude toward use, IT Consumerization research should examine the belief of privacy and security through the following hypothesis:

H1a: Privacy and security concerns about personal information loss or misuse will negatively influence an employee's attitude toward behavioral intentions to use IT Consumerization service in the workplace.

Performance Improvements

Research conducted by Loose, Weeger, and Gewald (2013) examined a performance expectancy construct as a direct influence upon intention to use IT Consumerization in the workplace. The inclusion of this item in their model was to determine if IT Consumerization use intention would be a predictor of employer attractiveness. Although the study has a different dependent variable outcome than that which is being examined in this research model, the idea of specifying a performance expectancy attribute as a reflective indicator of behavioral intention was nonetheless a supported hypothesis in their research, and in other similar research efforts. Ortbach, Bode, and Niehaves (2013a) also found support for performance expectancy in an individual's perceptions of performance improvements through the availability of

additional technologies with the implementation of IT Consumerization in the workplace. Performance improvement was not measured by effectiveness or efficiency but more specifically by accessibility of the service through alternate or additional access points. These researchers hypothesized that additional technologies would influence the performance improvement perceptions, and this hypothesis was the operational definition used in their study. Based upon the idea that employees have an alternate means of completing work-related tasks and accessing available corporate information, the following hypothesis was proposed:

H1b: Perceived performance improvements will have a positive influence on the user's attitude intention toward the behavioral intention to use IT Consumerization in his/her workplace.

Personal Innovativeness in IT

Some research which focused on the phenomenon of IT Consumerization included the Personal Innovativeness construct and was found in the work from Dernbecher Beck, and Weber (2013). They leveraged the study by Agarwal and Prasad (1998) and operationalized their use of personal innovativeness. Dernbecher et al. (2013) defined personal innovativeness as the willingness to try, and ultimately adopt, innovations in IT at an early stage of implementation.

Both self-efficacy and Personal Innovativeness are positioned as drivers of habits that lead to the use of IT Consumerization services in the Dernbecher model. Although Dernbecher et al. (2013) argued for the use of Personal Innovativeness in their model, which focused on habits, this description does not fit the proposed study. However, it did provide an opportunity for comparison with other studies focusing on factors that

influence the user's attitude toward the use of IT Consumerization, including the work from Ortbach et al. (2013a).

Likewise, Ortbach et al. (2013a) leveraged the study from Agarwal and Prasad (1998), and defined personal innovativeness as the willingness of an individual to experiment with, and ultimately adopt new technologies. Other researchers have hypothesized that Personal Innovativeness would influence the intention to use technology (Luarn & Lin, 2005; Kuo & Yen, 2009; Yang, 2005). In these studies, however, Personal Innovativeness was not supported as a direct influence and therefore was not considered as a factor for explaining the variance found within consumer intention to use. Of interest, however, is that Agarwal and Prasad (1998), unlike more recent researchers, presented the construct of Personal Innovativeness in their study as a moderator. It seems reasonable and even arguably acceptable that Personal Innovativeness of IT would moderate the relationship between the attitude toward the intention to use a service and the behavioral intention to use IT Consumerization.

The characteristic of being innovative, within a specific domain such as IT, was originally proposed in a model in which PIIT had a moderating effect on the attitude to use or upon the behavioral intention toward the actual use of a new technology (Agarwal & Prasad, 1998). Although only minimal support relating to this hypothesis was discovered, Agarwal and Prasad study did find one significant relationship between compatibility and intention to use, which was supported by PIIT and its moderating effect. For this study, PIIT was positioned as a moderating influence between the attitude toward use of IT Consumerization and the behavioral intention to use the service.

In a another study focusing upon consumer behaviors toward mobility services, Hung, Ku and Chang (2003) also found support for personal innovativeness as a partial predictor of user attitude leading to the intention to use a new technology. However, personal innovativeness was the weakest predictor among four other contributors which also supported attitudes toward the use of technology innovation. It was believed that personal innovativeness is a contributor to the research of mobility service intention to use, and was leveraged in an effort of operationalizing IT Consumerization in the workplace. PIIT was tested in the model as a moderator between attitude toward the behavior to use and the behavioral intention to use.

H2: Personal Innovativeness moderates the relationship between the attitude towards the intention to use the service and the behavioral intention to use IT Consumerization in the employee's workplace.

Consumerization Behavior of Co-Workers

Technology consumer research is sensitive to social norms where the strength and position of a single individual in an established relationship can influence another individual to make a choice or follow another selected direction. The social relationship in and of itself has a persuasive power that can increase market share and improve consumer intention and retention (Kleijnen et al., 2004; Nysveen et al., 2005). The more recent IT Consumerization research has also addressed these social relationships which may influence the employee's decision to consider the use of various technologies in the workplace (Dernbecher et al., 2013; Loose et al., 2013; Ortbach et al., 2013a).

IT Consumerization research includes the social influence construct as an influence upon the behavioral intention to use. By following the work from Venkatesh, Morris, Davis and Davis (2003), researchers of IT Consumerization have operationalized

the social influence construct through a definition that considers the degree to which an employee perceives that important others (co-workers) believe he/she should use the IT Consumerization service (Loose et al., 2013). Venkatesh, Thon, and Xu (2012) was cited by another IT Consumerization study in which the social influence construct definition was based upon the employee's perceptions of his/her co-workers' opinions, which were regarded as a barometer for the employee's decision to use (Dernbecher et al., 2013).

Both the consumer and the employee frame the social normative as an important conditional influence which leads to the intention to use. Technology consumer research has uncovered a relationship, which is typically consistent although not always supported, between social influence and behavioral intention to use. In order to understand the position of social influences in IT Consumerization research, a deeper look into the use of social normative as a construct was necessary within the larger domain of Information Systems research. The research from Taylor and Todd (1995) was targeted for this deep assessment and as further justification of the inclusion of the social influence construct in the presented model.

Taylor and Todd (1995) recognized the complexity of the normative and social normative constructs often referenced in technology use research today. They provided insight into the inclusion of the construct by dissecting various theoretical frameworks such as TRA, TAM, TPB, and Decomposed Theory of Planned Behavior (DTPB). The study gave both definition and support to the relationship between social influences and technology use (Taylor & Todd, 1995). One of the key points in their explanation

concerning social norms was the fact that a potential user must have some perception of a consequence (or consequences) associated with to "use or not to use".

In the case of IT Consumerization, consequences are perceived as a loss of respect or social position within one's peer group. Other consequences may be positive, whereby the use of IT Consumerization services may improve one's stature with a team and/or immediate supervisor (Ortbach et al., 2013b). One of the motivations identified in the IT Consumerization phenomenon (Weiss & Leimeister, 2013) was the need for consumers to have the most current technology. Because companies are not necessarily able to provide current devices to their employees with any regularity, an opportunity to encourage the use of personal devices with workplace access is created (Garcia & Silva, 2013). Social pressures that influence the technology consumer to own the most current device could therefore be an indirect motivation that promotes IT Consumerization into the workplace. Social pressure to own the most current technologies, experienced by consumers and their peers, might possibly be applicable to employees and their co-workers in the office. Based on the literature, previous studies, and clarification provided by Taylor and Todd (1995), the following hypothesis is proposed:

H3: Co-workers who use IT Consumerization in the workplace will positively impact an employee's behavioral intention to use IT Consumerization in the workplace.

Technology Department Support

The IT Consumerization research model included technology support as a representation of service quality and as a perceived behavioral control variable influencing the employee's attitude toward IT Consumerization. The idea of including perceptions of technical support as a condition which represents service quality is present in IS related research (Xu et al., 2012). Employee concerns regarding necessary technical

support for both usage and installation were also supported by the work from Ortbach et al. (2013b) and were defined as a perceived behavioral control belief of IT Consumerization.

By leveraging the recent service quality meta-analysis, empathy and responsiveness were identified as attributes which appear to be associated with both IT Department usage support and installation support of the IT Consumerization service (Xu et al., 2013). Additionally, these particular attributes seem to be related to the categorical beliefs which represent perceived behavioral controls defined by the theoretical framework of TPB (Ajzen, 1991). One categorical belief is that an individual has resources available to do the task (i.e., IT Department's empathy to understand the need); another is that the individual has the self-confidence needed to complete the relevant task (i.e., IT Department's responsiveness in offering assistance with solving the issue).

The assessment of these specific characteristics is present as part of Mobility Services research (Hung et al., 2003; Luarn & Lin, 2005; Wang et al., 2006) and IT Consumerization research (Dernbecher et al., 2013; Lebek et al., 2013; Ortbach, et al., 2013b). It is the position of this study that perceptions of IT Department service quality, including the attributes of empathy and responsiveness to provide support for IT Consumerization in the workplace, would lead to the following hypotheses:

H4a: An employee who perceives high levels of empathy from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.

H4b: An employee who perceives high levels of responsiveness from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.

Voluntariness

A final characteristic associated with perceived behavioral control is the condition of voluntariness. Moore and Benbasat (1991) compared voluntariness to perceived behavioral control as follows: The choice to use a technology made by adopters and non-adopters resides in the hands of the potential system users. Other researchers (Wang et al., 2006) noted the importance of voluntary conditions as an effect on the intention to use as representative of perceived behavioral control beliefs, i.e., credibility, self-efficacy, and financial resources (Wang et al., 2006). Potential users of IT Consumerization assume that the decision to use the mobile service is an employee's choice (Loose et al., 2012; Ortbach et al., 2013a, 2013b). Based upon the theoretical framework for this research project, it was recognized that voluntariness is a perceived behavioral control factor that could have a direct influence upon the employee's behavioral intention to use and proposed the following hypothesis:

H4c: Perceived voluntariness will have a positive influence on the employee's behavioral intention to use IT Consumerization in his/her workplace.

Attitude Intention and Behavioral Intention to Use

Researchers in the area of IT Consumerization have recently identified attitude as a construct which impacts behavioral intention to use (Ortbach, et al., 2013). Researchers focusing upon mobility services have similarly discovered that beliefs can drive attitude toward a behavioral intention to use (Kleijnen et al., 2004; Kuo & Yen, 2009; Wu & Wang, 2005; Yang, 2005). Other researchers have examined use from the perspective of extended use or continued use (Bhattacharjee, 2001). For the theoretical framework, support for the premise that the beliefs which sustain an individual's attitude will

positively influence the attitude intention toward a behavioral intention to use leads to the proposed hypothesis:

H5: The more favorable the attitude intentions toward IT Consumerization use in the workplace, the higher degree of behavioral intention to use.

The final stage in the development of the IT Consumerization operational model included the construct of Behavioral Intention to Use as a driver of Actual Use (Loose et al., 2013; Ortbach et al., 2013b). Similar research efforts have found support for behavioral intention to use which leads to actual use of mobility services (Hung et al., 2003; Luarn & Lin, 2005; Wang et al., 2006; Wu & Wang, 2005). With consideration for these results, along with the proposed theoretical framework, the project proposes the following hypothesis and presents the final operational model (Figure 2.3).

H6: Behavioral intention to use IT Consumerization in the workplace leads to confirmed usage.

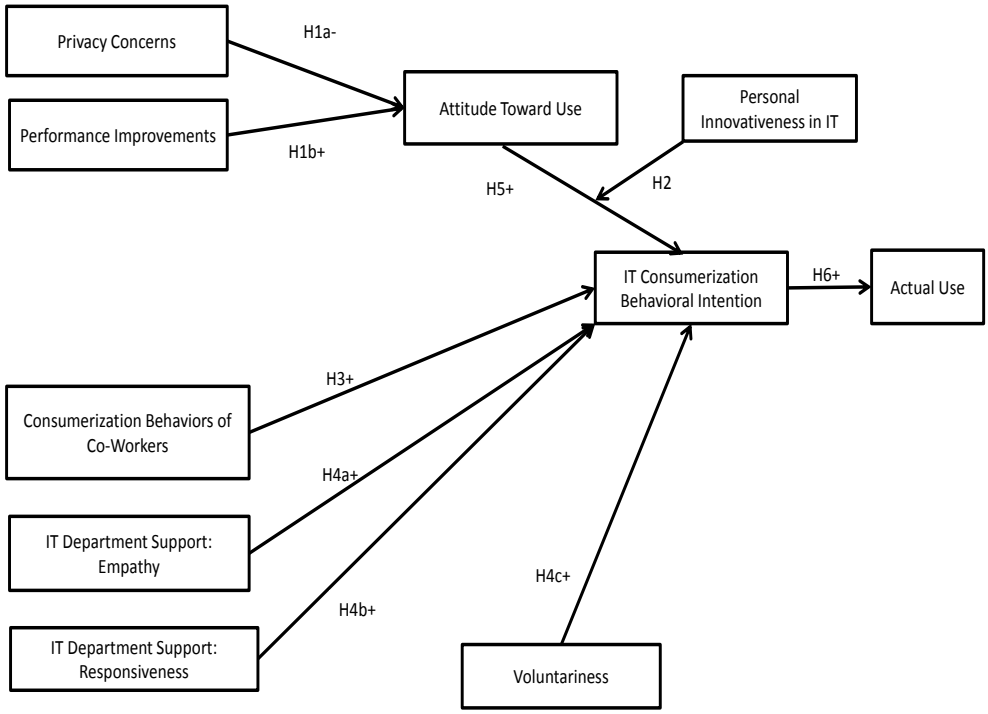

Figure 2.3: Proposed IT Consumerization Operational Model

IT Consumerization Use

The dependent variable of Actual Use includes self-reported use from employees who have already engaged in IT Consumerization Services via a personal device. The use of IT Consumerization Services is defined as using a personal device to complete work tasks which are associated with enterprise applications and which are deemed as required by the employee's work role activities. Researchers have identified self-report of actual use, as well as other types of objective measures of actual use in previous studies, as acceptable (Jain & Kanungo, 2005; Straub, Limyem, & Karahanna, 1995; Venkatesh, et al., 2003).

Applications used to perform work tasks included activities associated with ERP (enterprise resource planning), CRM (customer relationship management), KMS (knowledge management systems), and other portal-based applications that would be accessed and updated via a personal device. The use of IT Consumerization Services will be measured in relation to how often the personal device is used to access the application.

The proposed research project also included a measure of use based on the use of hardware type and identification of the applications or systems used. These types of measures were aimed at discovering the nature of the system use (Jain and Kanungo, 2005). The objective of the measures associated with the Actual Use variable was to uncover a deeper understanding of how the service was accessed and in what ways IT Consumerization Service was supporting the workforce which had the service option.

CHAPTER 3

METHODOLOGY

The methodology section provides an opportunity to determine the appropriate methodology for this research based on the research model and the corresponding hypothesis. It begins with a discussion on selected population and sample size, which is followed by a review of the instrumentation development and the historical results associated with each of the variables. The chapter concludes with a description of selected statistical methods, including confirmatory factor analysis for assessing a measurement model and use of structural equation modeling (SEM) for evaluating the proposed model's relationships.

Population and Sample Size

The target population included working professionals who are currently employed in the technology industry with companies that offer an IT Consumerization service to employees. Four companies were targeted for the pilot and were previously screened to ensure that the organizations met the criterion of offering an IT Consumerization service as an option for their employees before data was collected. The sample was a nonprobability sample (convenience sample) and was based upon employee availability. Data for the field study was collected from a single technology company. The electronic survey was distributed to 375 individual respondents. The targeted sample size was in preparation for potential adherence to the 10:1 ratio rule guideline for partial least squares structural equation modeling. The rule of 10 states: At least 10 cases should be included for each item in the instrument (Nunnally & Bernstein, 1994). In the final survey design,

32 scale items were presented to 375 respondents which resulted in 152 samples gathered for analysis. Consideration of the 10 responses guideline often associated with statistical path analysis methods, along with other research design attributes, would then result in the use of partial least squares for the structural equation model.

The availability to the sampling frame, which was an electronic questionnaire sent via email distribution group was made accessible to potential respondents in the target population through Qualtrics. Qualtrics is a private research software company which enables researchers to collect data samples associated with their developed survey instruments. The survey was open for a 6-week timeframe to allow for data gathering from the target sample size. The study of the population was cross-sectional rather than longitudinal and represented a single stage procedure. Access to the names associated with the target audience participating in the project was provided by corporate contacts via group email distribution. Once the instrument was developed, the survey was pretested before actual data was collected.

The pretest sample survey was presented to a small group of technology industry workers who currently have an option to use IT Consumerization services in the workplace. Twelve people were selected for pretesting based upon the recommendation of a minimum of 12 samples (Anderson & Gerbing, 1991), which was considered as appropriate for evaluating the face validity of the survey questions and for achieving the confidence that the question set was understood by the survey audience. The intention of the pretest was to identify any confusion or ambiguity that might have been experienced by the participants while providing their survey responses. Pretest samples were gathered through a mixed method design strategy with both the survey and the structured interview

in order to gain insight into any concerns that the participants had while responding to the survey items. Collected feedback was leveraged for the pilot test design with the intention of improving clarity and reducing ambiguity within the survey questions.

After adjustments to the survey were made based on the pretest results, the pilot survey was prepared. The pilot test was conducted via electronic survey design. Data was gathered from 28 respondents (9% of the target field sample) and gathered from technology industry workers who currently have the option to use an IT Consumerization service in the workplace. Responses were evaluated as to whether or not variation occurred within and between the observations. In addition, each single set of responses per individual was cleaned and confirmed it passed the manipulation check. Based upon the assessment of response variations and manipulation checks, the final survey design was reviewed and adjusted in preparation for field testing.

The field survey design was open to a single company within the technology industry which currently provides the option of an IT Consumerization service to their employees. Once the data was collected and cleaned, the manipulation check was verified, and an assessment of the measurement model followed. Hypothesis testing was completed using the PLS-SEM methodology.

Instrumentation Testing

Questionnaire items were developed based upon the concepts and constructs discussed in Chapter 2. The planned pretesting and pilot testing are in fact a method for evaluating the measurement model. The pretest assessed face validity as part of the instrumentation testing. The pilot testing considered the reliability of the constructs as well as initial variability within and between the constructs. This section discusses the

validity and reliability gathered from previous research for each construct positioned in the model.

The survey instrument was developed by using scales from various researchers. All sources were appropriately cited with confirmation of permission to use with the presented research project. The instrument was confirmed for overall validity of the constructs and for individual items using face validity, nomological validity, and confirmatory factor analysis. The following sections identify the scale item source, the Cronbach's Alpha target values, the sample size, and the tool used in hypotheses testing. These related details are summarized in Table 3.1.

Independent Variables

The model included the following independent variables: Privacy Concerns, Performance Improvements, Co-workers using IT Consumerization, IT Department Empathy, IT Department Responsiveness, and Voluntariness. Each variable which was introduced into the survey design was represented by either adopted or adapted items. The historical validity and reliability methodologies associated with previous IT Consumerization research can be found in Appendix A.

Both Privacy Concern (PC) and Performance Improvements (PI) were evaluated as characteristics that would influence the employee's attitude. Measures to be used to assess the individual's beliefs were selected from the work completed by Ortbach et al. (2013a) and from Lebek et al. (2013). It is important to mention that these scale items were originally adapted from other research, including Davis (1986) for assessing perceived performance improvements, and Pavlou (2007) for the scale items which measure privacy concerns. The scale measurement items for all the identified studies met

acceptable reliability standards for the applicable latent variables, and both researchers, using Fornell Larker's method of assessment found convergent and discriminant validity to exist within their models (Lebek et al., 2013; Ortbach et al., 2013a).

The independent variables of Technology Support Empathy (TSE) and Technology Support Responsiveness (TSR) were adapted from scale items found in an empirical study on Service Quality and were discovered within the IS quality research stream (Xu et al., 2013). The items were measured in an effort to assess perceptions of the employees toward their IT Department's ability to support the service and the expectation that these perceptions would influence the decision to use. Acceptable reliability was found within the Xu, Benbasat, and Cenfetelli (2013) model for the two indicators of empathy and responsiveness leading toward the construct of service quality. However, perceptions of service quality would only be represented by both empathy and responsiveness as individual variables. Each variable was hypothesized in this model to positively influence the latent variable representing the employee's perception of behavioral intention to use.

A measurement of Consumerization Behavior of Co-Workers (CBCW) was adapted from the work of Dernbecher et al. (2013). Their research reported satisfactory values for construct reliability, as well as face validity when measuring employee observations of his/her peers who may have been using the service. The inclusion of the social influence construct was in direct support of the theoretical framework and suggested that a social normative or a social influence affects behavioral intentions (Ajzen, 1991).

In comparing this model to the Dernbecher et al. (2013) model, an additional clarification of the applicability of the scale items should be considered. Dernbecher et al.'s (2013) research was such that the social influence variable is hypothesized as a moderator between habit and IT Consumerization use intention, which ultimately was not supported in their tested model. In the proposed model and following the TPB, the social influence variable was positioned as an influence upon the latent variable of behavioral intention to use and before any specific habit to use had developed. The scale items adapted for CBCW had both validity and reliability, and therefore were found to be acceptable for use in this research.

Scale items for the independent variable Voluntariness (VOL) as a perception of experience by the employee were measured through an adapted scale from Moore and Benbasat (1991). The perception's influence upon the behavioral intention to use was hypothesized with the assumption that the individual has a choice which makes him/her more comfortable to use IT Consumerization in the workplace. The theoretical framework of the model identified behavioral controls leading to the behavioral intentions; in fact, the perception of voluntariness lends itself to a sense of control by the potential system user. As a result of the rigor of evaluation on the perceptions of voluntariness (Bayer & Melone, 1989; Moore & Benbasat; 1991; Venkatesh, 2000) as being more than merely a binary variable, this research positioned VOL as a direct influence upon the latent variable of behavioral intention to use within the model.

Moderator Variable

The moderator of Personal Innovativeness of Information Technology (PIIT) was assessed through the scale items adopted from Agarwal and Prasad (1998). The

referenced research in IT Consumerization considered the works from both Dernbecher et al. (2013) and Ortbach et al. (2013a), who adopted their scale items from this work. Research on the IT Consumerization phenomenon, where the influence of PIIT is positioned to influence intention to use or behavioral effects, has uncovered mixed results with regard to relevant hypotheses. With these facts in mind, and with reference to the work of Agarwal and Prasad (1998) where the PIIT is discussed as a moderating variable toward the latent variables of use intentions, the PIIT construct is hypothesized as a moderating variable within the presented operational model.

Endogenous Variables

Attitude Intention (ATIU) and Behavioral Intention to Use (BITU) were measured based upon an employee perceptions of the service. BITU was adapted for this project based upon the work from Loose et al. (2013) which is rooted in the work completed by Brown and Venkatesh (2005). Employee attitude was assessed with the understanding that an employee would use a personal device to complete work tasks for his/her employer. Items were adopted in reference to the Lebek et al. (2013) study on IT Consumerization where studies presented by Nysveen et al. (2005) and Taylor and Todd (1995) were leveraged.

Dependent Variable

The actual use of an IT Consumerization service in the workplace was evaluated by the survey respondents' answers to questions pertaining to the use of enterprise applications and their particular hardware selection. The related research on Nature of Use and Self-Reported Use provided both reliability and validity to adapt the indicators in the proposed research (Jain & Kanungo, 2005; Saeed & Abdinnour-Helm, 2008).

Actual Use (AU) is presented as a culmination of both the selection of the enterprise applications and the preferred hardware to represent the nature of the use. The previous Actual Use reliability scores and sample size which supported use of the scale items are presented in Table 3.1.

Table 3.1: Research Related to Target for Construct Reliability and Sample Size

Construct	Abbreviation Construct	Study	Sample
Performance Improvement	PI	ACIS Ortbach et al., 2013 adapted from Davis, 1986	60 people with a 41% response rate
Privacy/Security Concerns	PC	ACIS Lebek et al., 2013 PU adapted from Pavlou et al., 2007	151 people with a 51% response rate
Consumerization Behavior of Co-Workers	CBCW	Dernbecher et al., 2013 ACIS Proceedings	71 students with a 9.47% response rate
Personal Innovativeness in Information Tech	PIIT	Dernbecher et al., 2013 ACIS Proceedings adapted from Agarwal and Prasad, 1998	71 students with a 9.47% response rate
Technology Support Empathy	SQE	Xu et al., 2013, MISQ	128 students and faculty placed in one of four treatment conditions
Technology Support Responsiveness	SQR	Xu et al., 2013, MISQ	128 students and faculty placed in one of four treatment conditions
Consumerization Voluntariness	VOL	Field Study 1 Field Study 2 Moore & Benbasat, 1991	540 respondents with a 68% response rate
Attitudes	AITU	Lebek et al., 2013	151 people with a 51% response rate
Behavioral Intention to use	BITU	Loose et al., 2013	177 students with a 20% response rate
Actual Use	AU	Jain & Kanungo, 2005	486 respondents with a 69% response rate

Control Variable

Control Variables in the study included the demographics of the respondent's birth year, gender, work role, and years of service. Additional information collected from the respondents included personal device types used with the service and applications accessed by the device. Finally, years of service with their current employer and the level of education were also requested during data collection.

Hypotheses Testing

Hypotheses testing was driven by a close examination of the intent of the study, guided by the research questions, and steered by the overall theoretical framework. A review of these conditions in relation to the hypothesis, which led to the selection of PLS-SEM as the proper statistical method for analyzing the hypothesized relationships is presented in this section. Additional support for selecting SEM as the method best suited for the hypotheses testing and analysis of the model included a review of reflective measures associated with the identified constructs.

The theory and the operational model are represented in the research questions and these elements of theory along with the research questions themselves do matter when selecting a statistical method (Urbach & Ahlemann, 2010). Considering the various relationships in the model and selecting the most efficient ways of testing is the responsibility of the researcher. If a variety of relationships (mediated, moderated, and direct) exist, then SEM will allow all the relationships to be tested simultaneously (Urbach & Ahlemann, 2010; MacKinnon, 2008). The research questions are represented by an operational model (see Chapter 2) which included causal relationships, including mediation, moderation, and direct causal conditions.

Measurement model assessments included a factor analysis which examined the loadings associated with the constructs. The loading is a statistical calculation found in factor analysis and is a means for confirming that the attributes represent the variables to which they are assigned (Hair, Black, Babin, & Anderson, 2010). The overall model variables had some level of correlation with all the variables and their attributes since all were part of the over-arching assumption for this study. However, each individual construct's assigned attributes were examined to assure each reflected the specific construct more than they reflected upon other constructs in the model. Construct validity, both convergent and discriminate, were evaluated by assessing the loading associated with each attribute and the average variance extracted for each construct. Fornell Larcker (1981) was leveraged in the data analysis as a method for looking at the squared correlations and explained variance, and specifically as a mechanism for assessing the validity of the assigned scales.

The reliability measure for the constructs was determined using Composite Reliability to assess whether or not the assigned scaled items measured the construct consistently. The reliability coefficient is an indicator of the repeatability of the scale items assigned to each of the constructs, specifically a measure of internal consistency (Nunnally & Bernstein, 1994). Measurement models need to have both sound reliability and validity in order to indicate that a model is ready for the assessment of causal relationships (Boudreau, Gefen, & Straub, 2001).

The nature of these research questions was to examine for causal relationships that occur between two or more independent variables and one dependent variable, and was based in a single theoretical framework. The measures included the assessment of

perceptions, all of which are latent and cannot be observed directly, and therefore were gathered via a self-report questionnaire. In addition, the research design included an assumption that the respondents' scores might not be normally distributed due to the data collection technique and the target sample size. Because the research was focused upon a more recently recognized phenomenon and even though existing scales were available to be leveraged for this project, many of the operational relationships were exploratory. These conditions guide the research to an appropriate strategy for hypotheses testing, including the consideration of the theoretical model which was well grounded but the phenomenon is new and it was appropriate that further research was required to test the theoretical relationships.

The operational model was built on the theoretical model that initially considered the individual's beliefs and attitudes which drive his/her intentions and ultimately the decision to use. Latent variables will either cause or form the indicators (Chin, 1998). The final model's specific items were confirmed to reflect the latent variables. In the operational model, for example, the variable of Consumer Behavior of Co-Workers (CBCW) was a reflection of an individual's perception related to the social influences that surrounded each survey respondent. CBCW is a perception about a social influence which was hypothesized to impact the behavioral intention and measured by the path coefficient between. The scale items are a means of assessing the validity and reliability of CBCW within the model.

The selection of the hypotheses testing method is an important decision for the researcher. After a consideration of the proposed model and theory which targeted causal relationships for examination, the PLS-SEM approach to testing was deemed acceptable.

The variable relationships among each of the constructs were quantified via path coefficients and were used to determine the significant relationships in the model.

CHAPTER 4

Data Analysis and Results

The hypotheses presented for this research study focus upon identifying potential influences that promote behavioral intention to use and actual use behaviors. These hypotheses include other possible relationships among the relationships within the current research work stream. Newly suggested relationships were evaluated with regards to their predictive strength upon an individual's personal perceptions of an available technology innovation and the intentions to use it in the workplace, i.e. IT Consumerization Services. Chapter 4 provides an analysis of the survey data gathered for the purpose of hypotheses testing. The findings and observations are presented below including the pre-assessment, the pilot study, and the field data analysis.

Survey Pre-Assessment

An initial evaluation of the survey design was completed by a small group of respondents (12) who are currently employed in the technology industry. Each was contacted via phone and then with a follow-up email to confirm their participation. Participants were asked to meet face-to-face (if possible), complete the survey, and then provide feedback during a one-on-one engagement. If participants were not available for face-to-face contact, then communication was done via phone during or following the completion of the survey. The questionnaire was an electronic survey that was available via personal mobile device or by a tablet provided by the researcher. Most individuals highlighted or suggested areas in the survey which they believed would improve the respondent's understanding of the questions. The feedback from these respondents

included general language changes, re-ordering of initial directions, updates to the task descriptions, and an additional explanation describing the purpose of the survey. Feedback also indicated the need for some aesthetic changes to the survey, including an adjustment to the flow of how the questions were presented, referencing the number of questions, and a progress bar presented throughout the course of the survey completion.

Pilot Data Assessment

The purpose of the pilot study was to gain insight into the actual constructs proposed in the research model. In an effort to establish a preliminary evaluation of the measurement model, the data was assessed via IBM SPSS Statistics v23. Specifically, the pilot data was assessed for how well the survey's design recognized the similarities among the attributes assigned to individual constructs, as well as acknowledged the differences among the individual constructs. The survey was completed by 28 respondents. These individuals were also technology workers supporting various business-related roles within the technology industry. The correlation data indicated moderate relationships among most of the constructs; however, some relationships were markedly stronger or noticeably weaker. These anomalies found within the pilot data required further exploration in preparation for the field study beginning with two particular constructs: Attitude toward Intention to Use (ATU) and Behavioral Intention toward Use (BIU).

During the pilot data analysis, the assessment between Attitude toward Intention to Use and Behavioral Intention toward Use indicated a strong relationship between these two constructs. Examining the correlations between the attributes assigned to Attitude toward Intention to Use and Behavioral Intention toward Use (Table 4.1), there appeared

to be a strong relationship among all the variables across the two constructs. Strong relationships among all the variables for two unique constructs may be an early indication of potential problems with construct validity. However, due to the small pilot sample size pooling both actual users and non-users respondents together (n=28), a similar condition may or may not be represented in the field study and therefore no changes were made to the applicable question sets. Both sets of questions for these two constructs were adapted from previous research. These studies reported acceptable reliability and validity; therefore, the pilot results were not anticipated to occur with a larger sample size and no changes were made to the survey questions (Lebek et al, 2013; Nysveen et al, 2005; Taylor and Todd, 1995).

Table 4.1: Pilot Correlation Data for Items Representing Attitude toward Intention to Use (ATU) and the Behavioral Intention to Use (BIU)

	ATU1	ATU2	ATU3	ATU4	ATU5	ATU6
ATU1	1.000					
ATU2	0.899	1.000				
ATU3	0.919	0.941	1.000			
ATU4	0.758	0.710	0.769	1.000		
ATU5	0.870	0.850	0.860	0.824	1.000	
ATU6	0.845	0.762	0.845	0.831	0.794	1.000
BIU1	0.893	0.755	0.802	0.740	0.786	0.859
BIU2	0.800	0.687	0.745	0.800	0.818	0.892
BIU3	0.848	0.731	0.819	0.817	0.815	0.941

Unlike the potential concern over the validity of the Attitude toward Intention to Use and Behavioral Intention toward Use constructs, the exogenous variable of Voluntariness (VOL) demonstrated an issue associated with internal consistency. Based on the correlations calculated among the three items, these attributes were not strongly related to one another. This internal inconsistency was reflected in the weak correlations

among the attributes (Table 4.2) as well as the composite reliability calculation referenced in Table 4.3 below.

Table 4.2: Pilot Correlation Data for Voluntariness

	VOL1	VOL2	VOL3
VOL1	1.000	0.199	0.254
VOL2	0.199	1.000	0.448
VOL3	0.254	0.448	1.000

The composite reliability, as a general rule, should not be less than .600 for the constructs proposed in the operational model (Nunnally and Bernstein, 1994).

Table 4.3: Pilot Composite Reliability

Constructs	Composite Reliability
Attitude toward Intention to Use	0.974
Actual Use	0.908
Negative Beliefs	0.887
Behavioral Intention to Use	0.976
Service Quality Empathy	0.943
Personal Innovativeness toward IT	0.564
Service Quality Responsiveness	0.899
Social Normative of Co-Workers	0.965
Voluntariness	0.567

Voluntariness was positioned as a perception of behavioral control and was represented by three particular questions as being indicators of Voluntariness. It was presented in this survey design as an ordinal measurement in which the perception of Voluntariness would be on a continuum or scale (Moore and Benbasat, 1991). The noted condition of low reliability necessitated a review of the existing language associated with each of the assigned questions. It was determined that one particular question was double-barreled and was adjusted by creating a fourth indicator for the field study. The pilot sample size was too low to justify the removal of any of these adopted attributes;

consequently, some language changes were made to the Voluntariness questions to assure each was properly adapted from the literature (Moore and Benbasat, 1991).

Service Quality Responsiveness and Service Quality Empathy attributes were examined for validity signals based upon the calculated correlations. After reviewing the correlations, the pilot data cross-loadings revealed issues with discriminant validity for the two constructs (Table 4.4). The two constructs' attributes were highly correlated between both constructs and would need careful consideration if similar conditions were discovered during the field study.

These two individual Service Quality constructs, both associated with SERVQUAL research (Xu et al., 2013), represent the respondent's perceived behavioral control in the research model. Each of the SERVQUAL construct attributes had a strong relationship with one another based upon the cross-loading data extracted from Smart PLS. However, with the small sample size, it was difficult to ascertain whether or not the two would be differentiated in the field study.

Table 4.4: Pilot Loading and Cross Loading Data

	ATT	AU	B-NEG	BITU	SQ EMPTY	PIIT	SQ RESP	SN	VOLU
ATU1	**0.95**	0.68	-0.19	0.88	0.44	0.54	0.25	0.33	-0.29
ATU2	**0.93**	0.67	-0.35	0.75	0.61	0.52	0.43	0.45	-0.39
ATU3	**0.96**	0.69	-0.27	0.82	0.58	0.55	0.37	0.39	-0.29
ATU4	**0.88**	0.60	-0.22	0.81	0.51	0.54	0.42	0.38	-0.20
ATU5	**0.93**	0.60	-0.21	0.84	0.47	0.48	0.28	0.45	-0.34
ATU6	**0.91**	0.73	-0.01	0.93	0.51	0.48	0.36	0.39	-0.28
AU1	0.61	**0.77**	0.07	0.56	0.40	0.63	0.33	0.40	-0.35
AU2	0.61	**0.85**	0.18	0.68	0.62	0.31	0.68	0.53	-0.41
AU3	0.61	**0.84**	0.13	0.71	0.50	0.43	0.42	0.46	-0.27
AU4	0.39	**0.81**	0.00	0.42	0.59	0.53	0.63	0.61	-0.22
AU5	0.62	**0.80**	-0.18	0.63	0.56	0.60	0.42	0.50	-0.28
BNEG1	-0.10	0.05	**0.82**	0.11	-0.38	0.12	-0.25	0.00	0.27
BNEG2	-0.03	0.12	**0.70**	0.13	-0.21	0.05	-0.13	0.10	0.08
BNEG3	-0.09	0.09	**0.80**	0.10	-0.41	0.19	-0.39	-0.11	0.17
BNEG4	-0.27	0.03	**0.93**	-0.03	-0.30	-0.22	-0.13	0.03	0.01
BIU1	0.87	0.78	0.02	**0.96**	0.41	0.43	0.32	0.37	-0.32
BIU2	0.85	0.66	0.09	**0.96**	0.39	0.50	0.25	0.33	-0.23
BIU3	0.90	0.73	0.00	**0.98**	0.48	0.46	0.33	0.39	-0.27
EMPT1	0.55	0.62	-0.27	0.43	**0.94**	0.35	0.87	0.42	-0.27
EMPT2	0.51	0.57	-0.43	0.45	**0.86**	0.36	0.67	0.29	-0.06
EMPT3	0.26	0.52	-0.30	0.13	**0.86**	0.40	0.81	0.36	-0.04
EMPT4	0.53	0.59	-0.35	0.39	**0.93**	0.37	0.86	0.55	-0.23
PIIT-1	0.43	0.41	-0.11	0.36	0.30	**0.89**	0.17	0.26	0.07
PIIT-2	0.00	0.21	0.00	-0.02	0.13	**0.34**	0.02	-0.11	0.11
PIIT-3	-0.31	-0.38	0.02	-0.26	-0.28	**-0.16**	-0.31	-0.40	0.17
PIIT-4	0.26	0.32	0.04	0.25	0.17	**0.73**	0.09	-0.05	0.32
RESP1	0.20	0.53	-0.15	0.09	0.69	0.34	**0.77**	0.33	0.06
RESP2	0.34	0.46	-0.26	0.28	0.80	0.26	**0.90**	0.41	-0.11
RESP3	0.38	0.61	-0.18	0.32	0.81	0.26	**0.92**	0.49	-0.23
SN-1	0.35	0.50	0.03	0.28	0.40	0.36	0.38	**0.95**	-0.55
SN-2	0.38	0.64	0.11	0.36	0.39	0.36	0.50	**0.94**	-0.50
SN-3	0.47	0.57	-0.13	0.41	0.49	0.28	0.50	**0.96**	-0.66
VOL1	0.03	0.03	0.00	0.04	-0.26	0.19	-0.21	-0.12	**0.10**
VOL2	0.02	-0.17	0.18	-0.01	-0.30	0.03	-0.38	-0.62	**0.45**
VOL3	-0.31	-0.36	0.11	-0.27	-0.22	0.14	-0.18	-0.59	**0.99**

One final construct which signaled inconsistencies from the pilot data was Personal Innovation toward Information Technology (PIIT). The correlation values

measured within the construct were moderate in strength. However, as already referenced in Table 4.3, Personal Innovativeness toward Information Technology signaled potential inconsistencies among the four attributes assigned to the construct. The inconsistency is demonstrated by the composite reliability score of .564. This is below the recommended threshold of .600; again, see Table 4.3 above (Nunnally and Bernstein, 1994) and signaled potential future reliability issues for the field study.

Also identified in the pilot study analysis of the PIIT construct, one item in particular was flagged for further assessment, specifically Attribute 3. Attribute 3 or the PIIT3 (Question 3) was designed as a reverse-coded manipulation check. Of the 28 respondents, 5 individuals demonstrated inconsistency in their responses when comparing the overall response patterns between the reverse coded item and the standard language items for each PIIT question. Removing the 5 respondents from the pilot data and adjusting the reverse coded item resulted in a confirmation of a strong PIIT in the correlation matrix (Table 4.5). For the field study, the reverse code manipulation check was removed due to demonstrated confusion among the respondents. The remaining questions were reviewed to ensure consistent language.

Table 4.5: Pilot Correlation Data within the PIIT Construct

	PIIT1	PIIT2	PIIT3	PIIT4
PIIT1	1	.511**	.829**	.716**
PIIT2	.511**	1	.653**	.614**
PIIT3	.829**	.653**	1	.679**
PIIT4	.716**	.614**	.679**	1

The overall conditions observed during the assessment of pilot data provided insights about how to fine-tune the field data questions for improved quality. Observations from the pilot data correlation assessment were early warning signals of

potentially similar conditions between and within the model's constructs. While some lessons were learned from the pilot study that was supportive for improving the field study, other conditions required additional attention. The next section is the field data assessment and it begins with a review of the data demographics. This is followed by a discussion around a secondary manipulation check and a presentation of results including measurement model analysis, quality assurance, and finally an assessment of the structural equation model.

Field Data Assessment

The purpose of the field data assessment section is to present the hypotheses test results associated with the operational model based upon field survey data. The analysis method used was Partial Least Squares (PLS). The justification for using PLS to analyze the corresponding data within this research design is 1) the addition of the service quality constructs as exploratory variables representing perceived behavioral control, 2) flexibility in modeling higher order models, and 3) a smaller sampling condition.

The proposed research model was designed to evaluate the influence of select constructs upon the intentions toward use and the actual use of an IT Consumerization service from an employee-owned personal device. The exogenous variables were hypothesized to influence Attitude Intention toward Use and Behavioral Intention to Use and included Positive Beliefs, Negative Beliefs, Co-worker Social Normative, Service Quality and Voluntariness. The mediating variables are Attitude toward Intention to Use (ATIU) and Behavioral Intention toward Use (BITU) with the dependent variable being Actual Use (AU) for those respondents who confirmed use of the innovation. For the Non-User respondents, Behavioral Intention toward Use is presented as the single

dependent variable. The research model also hypothesized that Personal Innovativeness toward Technology (PIIT) would moderate the relationship between Attitude Intention and Behavioral Intention toward Use. All of the constructs were assessed for reliability, convergent validity, and discriminant validity. The following sections discuss the process for reaching a quality measurement model, along with some general observations which support final tuning of the model for both Users and Non-Users of the IT Consumerization Service based upon good statistical practices.

Sample Demographics. The research project targeted technology workers in the technology industry currently employed by a technology company which offers an Information Technology Consumerization service to their employees. Employees can decide for themselves to use or not to use the available service on their personal devices. The survey was distributed to a single department of approximately 400 employees within a Fortune 50 Information Technology company. A total of 152 pooled responses were received, of which 7 were removed because more than half of the individual responses contained incomplete or unanswered questions (Hair, Hult, Ringle, and Sarstedt, 2014). One additional respondent's data was removed due to straight-lining the response for all survey items. The final data set, which was gathered as a convenience sample using the Qualtrics electronic survey tool, concluded with 144 clean submissions and a 37% response rate.

Sample demographics indicated an average age of 53 years, along with a high concentration of project managers, and twenty plus years of experience in the industry. The sample included 72 males and 58 females. Additional demographics associated with the sample are provided in Table 4.6 below.

Table 4.6: Field Data Demographics

Age Ranges			**Gender**	
29-39	6		Males	72
40-50	41		Females	58
51-59	67		Not Provided	14
> 60	22		**Education**	
Unknown	8		Prefer not to Say	2
Employee Role			High School	12
Individual Performer	11		Associates Degree	15
Team Leader	7		Bachelor Degree	23
Project manager	102		Advanced Degree	46
Manager	19		Specialty Cert	47
Director/Executive Leader	5			
Applications accessed via IT CONSUMERIZATION			**Mobile Devices using IT CONSUMERIZATION**	
ERP	7		Laptop Use	32
KMS	6			
CRM	2		Smart Phone Use	55
Collaboration Svc	53			
Other	25		Tablet Use	26
None Not Using IT CONSUMERIZATION	69		None Not using IT CONSUMERIZATION	69
Years in the Industry			**Years with Current Employer**	
less than 1 year	0		less than 1 year	0
1-3 years	1		1-3 years	4
4-10 years	4		4-10 years	25
11-20 years	34		11-20 years	40
21 years or more	103		21 years or more	73
Prefer not to answer	2		Prefer not to answer	2

Common Methods Bias Analysis. The pooled data was gathered as a cross-sectional, single method sample, and tested for Common Method Bias (CMB) using the Harmon Single Factor technique. Leveraging SPSS v23, the data was checked for the percentage of variance explained by a single factor in the analysis. This technique

suggests that as long as no more than 50% of the variance is explained by one random factor then common method bias is not likely to exist in the data set. The IT Consumerization field data was assessed using the Harmon One Factor test, which resulted in variance explained at 38% for a single factor (Table 4.7). The value is an indication that CMB is not a concern for the collected sample.

Table 4.7: Harmon's Single Factor Results

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.841	38.448	38.448	13.841	38.448	38.448
2	3.312	9.200	47.648			
3	3.009	8.358	56.006			
4	2.143	5.951	61.958			
5	1.613	4.482	66.440			

All survey questions were presented in randomized order; this approach is also noted as a means to reduce or eliminate CMB in quantitative research (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). The presented measurement models were deemed ready for structural path analysis and hypothesis testing.

Sample Comparison. As part of the field study, the respondents were presented questions that would confirm Actual Use versus Non Use of the IT Consumerization service. The respondents that reported strong Actual Use (i.e., scale items reported as >3) would also be required to identify hardware technology used and the information system that was accessed with their personal device. This was considered to be a manipulation check because it would validate those respondents indicating particular use of hardware and software and rating actual use as >3.0 for the corresponding attributes of Actual Use.

Evaluation of the manipulation check identified 19 inconsistent responses regarding actual use. Specifically, seven respondents indicated high use of the IT

Consumerization service without identifying the technology or the application. Twelve respondents reported no use of the IT Consumerization service but selected hardware or software used with the IT Consumerization service. These responses represented an illogical and inconsistent pattern of actual use. The details were individually examined and adjusted to preserve the consistency of the survey's intent. The respondents with Actual Use scaled items greater than 3 were categorized as actual users (7) while those with responses to Actual Use being 3 or less were classified as Non-Users (12). The sample data was separated into the two groups: Users and Non-Users of the IT Consumerization service. The measurement model was analyzed for each group, along with an analysis of the pooled data set.. The analysis of the measurement model was three-fold with consideration given to all three data sets (n=75 Users, n=69 Non-Users, and n=144 Pooled).

Analysis of the Measurement Model

The proposed measurement models were analyzed using Smart-PLS in preparation for the structural analysis and the comparison (similarities and differences) of each groups' data sets. More specifically, the comparison of Users and Non-Users' intentions toward use of the technology innovation were examined. The measurement analysis uncovered similar conditions as to what was observed with the pilot data set. The results for each measurement model analysis are presented below. Each model was examined for potential opportunities to improve internal consistency and construct validity for all latent variables contained within the measurement model design.

Internal Consistency. Beginning with internal consistency, each data set (Users and Non-Users) as well as the pooled data was evaluated. The latent variables were

tested for internal consistency through the use of two different testing methodologies: composite reliability (CR) and Cronbach's alpha (CA). Both tests calculated how consistent the survey responses were for each combination of items assigned to each of the applicable latent variables. Cronbach's alpha requires >.700 value, while composite reliability calculations are acceptable at >.600 (Nunnally and Bernstein, 1994). Only the latent variable of Voluntariness was found not to be acceptable for both tests (CR = .540; CA = .655) within the pooled data set. All other latent variables met the criterion threshold for one or both of the internal consistency assessments (Table 4.8).

Table 4.8: Internal Consistency for ITC Model Assessment

	ITC Users (n=75)		Non-ITC Users (n=69)		Pooled ITC Sample (n=144)	
Latent Variables	CR(75)	CA(75)	CR(69)	CA(69)	CR(144)	CA(144)
Attitude toward Intention	0.959	0.948	0.960	0.950	0.967	0.959
Actual Use	0.861	0.795	0.863	0.801	0.891	0.845
Behavioral Intention	0.943	0.909	0.945	0.911	0.959	0.935
Co-Worker Social Norms	0.901	0.835	0.890	0.814	0.901	0.834
Negative Beliefs	0.892	0.837	0.957	0.940	0.925	0.892
Personal Innovativeness in IT	0.865	0.807	0.850	0.769	0.876	0.812
Positive Beliefs	0.880	0.820	0.907	0.862	0.906	0.862
Service Quality Empathy	0.897	0.848	0.889	0.834	0.895	0.843
Service Quality Responsiveness	0.869	0.775	0.878	0.788	0.874	0.782
Voluntariness	0.735	0.568	0.691	0.802	0.540	0.655

Notes:
CR = Composite Reliability
CA = Cronbach's Alpha

Confirmatory Factor Analysis. While leveraging a confirmatory factor analysis procedure, both the loadings and cross-loadings for each construct were examined as a first step. The analysis uncovered similar conditions originally identified in the pilot. Both User and Non-User groups, as well as the pooled data set had similar loading and/or cross loading conditions. The validity conditions were associated with Service Quality Empathy, Voluntariness, Intentions toward Use, Personal Innovativeness toward Information Technology, and Actual Use latent variables. The initial confirmatory

analysis outputs from each unique group can be found in Table 4.9 (75 Users), Table 4.16 (69 Non-Users). For the pooled data, loads and cross loading details can be found in Table 4.19 (144 Pooled). Each data set identified minor convergent and/or discriminant validity challenges. A discussion on the confirmatory factor analysis procedure is presented below, including both convergent and discriminant validity assessments.

User Group Construct Validity. The assessment of discriminant validity was based upon observations associated with the initial outer and cross loading values contained in the table below (Table 4.9).

Table 4.9: User Group Outer Loading and Cross Loading Data for 75 ITC Users

	ATT	AU	BITU	CWSN	NEGB	PIIT	POSB	SQEMP	SQRESP	VOLU
AT1Q22	**0.937**	0.591	0.771	0.441	-0.165	0.154	0.484	0.303	0.398	-0.163
AT2Q23	**0.889**	0.472	0.671	0.320	-0.273	0.223	0.437	0.380	0.417	-0.204
AT3Q24	**0.871**	0.538	0.742	0.359	-0.345	0.264	0.413	0.511	0.562	-0.141
AT4Q25	**0.934**	0.607	0.777	0.358	-0.308	0.213	0.452	0.436	0.488	-0.165
AT5Q26	**0.801**	0.585	0.629	0.215	-0.340	0.137	0.412	0.481	0.563	-0.091
AT6Q27	**0.914**	0.534	0.766	0.348	-0.146	0.201	0.531	0.288	0.390	-0.208
AU1Q31	0.454	**0.560**	0.457	0.353	-0.115	0.102	0.368	0.324	0.277	-0.041
AU2Q32	0.407	**0.768**	0.409	0.492	-0.204	0.247	0.393	0.292	0.306	-0.272
AU3Q33	0.511	**0.866**	0.578	0.460	-0.196	0.312	0.465	0.355	0.397	-0.202
AU4Q34	0.529	**0.718**	0.637	0.334	-0.110	0.188	0.330	0.424	0.471	-0.246
AU5Q35	0.400	**0.807**	0.554	0.234	-0.039	0.305	0.336	0.470	0.416	-0.464
BI1Q28	0.797	0.734	**0.914**	0.407	-0.248	0.218	0.418	0.447	0.558	-0.215
BI2Q29	0.739	0.585	**0.915**	0.244	-0.205	0.241	0.410	0.419	0.505	-0.232
BI3Q30	0.709	0.658	**0.930**	0.265	-0.184	0.279	0.358	0.400	0.467	-0.226
NB1Q1	-0.232	-0.150	-0.194	0.059	**0.814**	-0.139	0.019	-0.284	-0.341	0.029
NB2Q2	-0.266	-0.082	-0.123	0.076	**0.870**	0.025	-0.006	-0.244	-0.241	-0.033
NB3Q3	-0.211	-0.186	-0.210	-0.195	**0.718**	-0.145	0.013	-0.226	-0.259	0.092
NB4Q4	-0.248	-0.162	-0.247	0.038	**0.874**	0.000	0.030	-0.228	-0.279	0.128
PB1Q47	0.412	0.394	0.341	0.272	0.006	0.153	**0.811**	0.118	0.063	-0.176
PB2Q48	0.429	0.407	0.357	0.224	0.000	0.269	**0.828**	0.331	0.345	-0.102
PB3Q49	0.310	0.193	0.227	0.154	0.138	0.138	**0.758**	0.109	0.083	0.052
PB4Q50	0.466	0.559	0.425	0.285	-0.050	0.390	**0.819**	0.355	0.280	-0.175
PIT1Q8	0.254	0.341	0.300	0.041	0.020	**0.887**	0.320	0.225	0.242	-0.047
PIT2Q9	0.089	0.155	0.122	0.108	0.035	**0.689**	0.255	0.168	0.161	-0.119
PIT3Q10	0.047	0.092	0.100	-0.046	-0.032	**0.695**	0.138	0.147	0.143	-0.088
PIT4Q11	0.201	0.270	0.213	-0.043	-0.234	**0.854**	0.209	0.279	0.320	0.031
SN1Q5	0.405	0.390	0.299	**0.876**	-0.048	0.112	0.237	0.318	0.375	-0.012
SN2Q6	0.275	0.397	0.284	**0.884**	-0.004	-0.082	0.148	0.208	0.245	-0.122
SN3Q7	0.314	0.491	0.292	**0.840**	0.061	0.016	0.387	0.255	0.166	-0.128
SQE1Q12	0.256	0.389	0.285	0.177	-0.221	0.196	0.206	**0.827**	0.666	-0.274
SQE2Q13	0.431	0.412	0.452	0.318	-0.404	0.235	0.219	**0.844**	0.766	-0.084
SQE3Q14	0.336	0.457	0.344	0.246	-0.151	0.338	0.285	**0.835**	0.744	-0.128
SQE4Q15	0.407	0.421	0.400	0.226	-0.169	0.128	0.275	**0.803**	0.691	-0.036
SQR1Q16	0.371	0.335	0.387	0.185	-0.282	0.178	0.082	0.678	**0.784**	-0.065
SQR2Q17	0.581	0.499	0.570	0.368	-0.338	0.267	0.260	0.805	**0.905**	-0.089
SQR3Q18	0.303	0.422	0.396	0.160	-0.209	0.276	0.270	0.675	**0.796**	-0.070
VOL1Q19	0.066	0.066	-0.043	0.125	0.050	-0.003	0.147	0.147	0.144	**0.312**
VOL2Q20	-0.193	-0.436	-0.249	-0.058	0.030	-0.147	-0.118	-0.188	-0.174	**0.873**
VOL3Q21	-0.089	-0.136	-0.138	0.023	0.198	-0.051	-0.157	-0.059	-0.013	**0.720**
VOL4Q51	-0.131	-0.092	-0.128	-0.271	-0.090	0.181	-0.092	-0.073	0.015	**0.601**

The measurement model cross loading values provided a good indication that each construct was close to achieving discriminant validity. Only a few attributes required a more detailed investigation which resulted in adjustments within the model which improved the overall quality. For the User Group data sample, the primary items of concern were associated with 1) Service Quality Empathy and Service Quality Responsiveness, 2) Intentions toward Use and Actual Use, and 3) Voluntariness.

Beginning with Service Quality Empathy (SQEMP) and Service Quality Responsiveness (SQRESP), the cross-loadings among the items (noted with an "*" in the table below) as well as the spread of the outer loadings for all the items assigned to these two constructs (Table 4.10) raised some concerns. An alternate approach was necessary to achieve measurement model validity before assessing structural soundness as represented by the predictive relevance and predictive accuracy of the research model.

Table 4.10: Service Quality Cross Loadings

	SQEMP	SQRESP
SQE1Q12	**0.827**	0.666
SQE2Q13	**0.844**	**0.767***
SQE3Q14	**0.835**	0.744
SQE4Q15	**0.803**	0.691
SQR1Q16	0.678	**0.784**
SQR2Q17	**0.805***	**0.905**
SQR3Q18	0.675	**0.796**

The Service Quality construct loadings (outer loading and cross loading values) which existed between Service Quality Responsiveness and Service Quality Empathy raised the question of how different were these supposedly two discrete constructs. Because these two individual constructs are 1) rooted in SERVQUAL literature, 2) *a priori* service quality research supported both constructs when assessing service quality

perceptions, and 3) the loading values presented here demonstrate that the attributes cluster around both constructs similarly, a second order component was created for the User Group's measurement model.

The constructs of Behavioral Intention to Use (BITU) and Actual Use (AU) were then examined as part of the initial assessment of the outer loadings and cross loadings (Table 4.9). An immediate concern with a low outer loading for the Actual Use attribute AU1Q31 (.560) was identified as a potential attribute to be removed from the model. The Actual Use construct in general does not demonstrate a narrow spread or the high loadings required to achieve discriminant validity; however, the removal of AU1Q31 helps the Actual Use construct to improve the quality of its position within the measurement model. Next, the BI1Q28 item was flagged with regards to the high cross loading onto Actual Use (see Table 4.11) which was loading higher onto the Actual Use construct than some of the attributes assigned to it. In an effort to prepare the model for structural equation model assessment, the aforementioned condition were resolved by eliminating the BI1Q28 attribute, thereby helping the measurement model to achieve construct convergent validity.

Table 4.11: Actual Use and Behavioral Intention to Use Outer and Cross Loadings

	AU	**BITU**
AU1Q31	0.560	0.457
AU2Q32	0.768	0.409
AU3Q33	0.866	0.578
AU4Q34	0.718	0.637
AU5Q35	0.807	0.554
BI1Q28	**0.734**	0.914
BI2Q29	0.585	0.915
BI3Q30	0.658	0.930

Finally, each of the attribute loadings on the construct of Attitude toward Intention to Use (ATIU) was evaluated. To achieve discriminant validity, the loadings should be narrow in range and high in value (Chin, 2010). Below are the loads all reporting above .870 with the exception of AT5Q26 (.801). The AT5Q26 attribute was removed as a final step to improve the quality of the measurement model (Table 4.12).

Table 4.12: Attitude Toward Intention to Use Outer Loadings

	ATIU
AT1Q22	0.937
AT2Q23	0.889
AT3Q24	0.871
AT4Q25	0.934
AT5Q26	**0.801**
AT6Q27	0.914

After a closer examination of the Attitude Toward Intention to Use attributes, it was also noted that Behavioral Intention Toward Use had some high cross loadings with this construct (Table 4.9). Although the loadings are higher among the attributes for these two constructs (Table 4.13), there is still enough of a difference in the explained variance between each of these two constructs' attributes (Chin, 2010) to keep the remaining attributes for each assigned construct in the measurement model.

Table 4.13: Compare Attitude Intention and Behavioral Intention toward Use Loadings

Latent Variable (LV)	ATIU Outer Loads (OL)	AITU OL% as an assigned attribute	ATIU xLoad w/BITU (XL)	ATIU xLoad% as an Unassigned Attribute	Difference Shared Variance (SV) % Between
AT1Q22	0.943	0.889	0.711	0.506	0.383
AT2Q23	0.900	0.810	0.652	0.425	0.385
AT3Q24	0.871	0.759	0.695	0.483	0.277
AT4Q25	0.929	0.863	0.718	0.516	0.347
AT6Q27	0.935	0.873	0.733	0.537	0.336

Latent Variable (LV)	BITU Outer Loads (OL)	BITU OL% as an assigned attribute	BITU xLoad w/ATIU (XL)	BITU xLoad% as an Unassigned Attribute	Difference Shared Variance (SV) % Between
BI2Q29	0.950	0.902	0.743	0.553	0.349
BI3Q30	0.952	0.906	0.716	0.512	0.394

The attributes assigned to each of the specific constructs are narrow in spread and high in value for each individual construct. The shared variance overlap among these same attributes onto the unassigned construct is negligible. Using the Chin guidelines the research model meets the convergent validity requirement necessary for structural model assessment. Chin (2010) explains that as long as the assigned construct attributes report (variance explained) 20% more than the unassigned attribute on the same construct, then discriminant validity is achieved (see Appendix B for additional discussion).

Finally, three other constructs indicated potential challenges with the model's convergent validity: Voluntariness (VOL), Negative Beliefs (NEGB), and Personal Innovation toward Information Technology (PIIT). Beginning with Voluntariness, two of the assigned attributes were not strong contributors of the variance explained for this construct resulting in the removal of VOL1Q19 and VOL4Q51. A similar condition was found for some of the attributes assigned to the Personal Innovation toward Information Technology also resulting in the removal of two attributes PITQ9 and PITQ10 (see Table 4.14 below). Finally, NB3Q3 was removed due to a low outer loading.

Table 4.14: Items Removed from User Group Model

Latent Variables	Individual Items	Outer Loading	Identified Validity Issue
Voluntariness	VOL1Q19	0.312	Issue with Convergent Validity
Voluntariness	VOL4Q51	0.601	Issue with Convergent Validity
Negative Beliefs	NB3Q3	0.675	Issue with Convergent Validity
Personal Innovation	PITQ9	0.688	Issue with Convergent Validity
Personal Innovation	PITQ10	0.695	Issue with Convergent Validity

In summary, the following changes were made to fine-tune the quality of the measurement model. Attributes which compromised the quality of the measurement model were resolved or removed from the measurement model. Service Quality was modeled as a second order construct for the model examining Users of ITC. The internal consistency and convergent validity were checked after these model changes were completed.

Table 4.15 provides support as a confirmation that all minimum thresholds for discriminant validity were met after modifying the measurement model using the changes described above (based upon the Fornell-Larcker criterion test and the Average Variance Extracted values). The composite reliability was also deemed as acceptable (Chin, 1998) for the User Group measurement model. With the creation of the second order Service Quality construct, the first order values were no longer required to meet conditions of validity, however, the values are still included as part of the reported results (Hair, et al., 2014).

Table 4.15: Final User Group Measurement Model Confirmatory Factor Analysis Values

	CR[a]	AVE[b]	ATIU	AU	BITU	CWSN	NEGB	PIIT	POSB	SQ-2ND ORD[c]	SQEMP	SQRESP	VOL
Attitude toward Intention	0.963	0.839	0.839										
Actual Use	0.881	0.650	0.567	0.650									
Behavioral Intention	0.950	0.904	0.767	0.624	0.904								
Co-Worker Social Norms	0.901	0.752	0.400	0.427	0.268	0.752							
Negative Beliefs	0.907	0.766	-0.256	-0.137	-0.179	0.064	0.766						
Personal Innovativeness toward IT	0.889	0.800	0.264	0.351	0.303	0.008	-0.064	0.800					
Positive Beliefs	0.880	0.647	0.507	0.447	0.404	0.295	0.017	0.304	0.647				
SQ Higher Order	0.926	0.642	0.454	0.520	0.473	0.306	-0.304	0.299	0.284	0.642			
Service Quality Empathy	0.898	0.688	0.403	0.495	0.420	0.293	-0.271	0.276	0.295	0.973638[d]	0.688		
Service Quality Responsiveness	0.870	0.691	0.479	0.511	0.502	0.296	-0.320	0.305	0.246	0.955119[d]	0.86246[d]	0.691	
Voluntariness	0.829	0.709	-0.184	-0.423	-0.230	-0.028	0.105	-0.093	-0.158	-0.158	-0.174	-0.128	0.709

a. Composite Reliabilty (CR) representing internal consistency, minimum threshold is > .600
b. Average Variance Extracted (AVE) as an indicator of acceptable discriminant validity when > .50
c. SQ-2nd Order combined as a higher order component for Service Quality Empathy and Service Quality Responsiveness
d. Lower order components no longer required to achieve discriminant validity

Non-User Group Construct Validity. The first step in the measurement analysis for the Non-User group was the elimination of the Actual Use construct. As previously stated, the Non-User group was not a group of actual users and therefore would not be able to respond to perceptions of use. The initial measurement model assessment of the Non-User Group data is referenced in Table 4.16. The information was used to identify and resolve both convergent and discriminant validity issues with the Non-User group data.

Table 4.16: Initial Loadings and Cross Loadings for 69 Non-Users

	AITU	BITU	CWSN	NEGB	PIIT	POSB	SQEMP	SQRESP	VOL
AT1Q22	**0.932**	0.756	0.436	-0.443	0.241	0.621	0.292	0.243	0.213
AT2Q23	**0.923**	0.764	0.474	-0.517	0.327	0.624	0.347	0.307	0.245
AT3Q24	**0.859**	0.840	0.547	-0.276	0.309	0.714	0.414	0.280	0.266
AT4Q25	**0.924**	0.792	0.509	-0.488	0.294	0.614	0.348	0.298	0.284
AT5Q26	**0.814**	0.663	0.503	-0.241	0.254	0.588	0.281	0.249	0.260
AT6Q27	**0.911**	0.763	0.457	-0.398	0.317	0.605	0.357	0.284	0.124
BI1Q28	0.771	**0.955**	0.531	-0.246	0.325	0.646	0.468	0.334	0.299
BI2Q29	0.794	**0.876**	0.534	-0.283	0.217	0.550	0.416	0.386	0.139
BI3Q30	0.803	**0.934**	0.521	-0.305	0.331	0.653	0.448	0.334	0.326
NB1Q1	-0.312	-0.214	-0.016	**0.911**	0.046	-0.149	-0.200	-0.085	-0.186
NB2Q2	-0.322	-0.193	0.056	**0.875**	-0.029	-0.092	-0.157	-0.114	-0.256
NB3Q3	-0.461	-0.347	-0.149	**0.936**	-0.107	-0.279	-0.256	-0.221	-0.169
NB4Q4	-0.483	-0.314	-0.147	**0.956**	-0.154	-0.303	-0.213	-0.170	-0.122
PB1Q47	0.613	0.614	0.555	-0.190	0.483	**0.901**	0.283	0.215	0.112
PB2Q48	0.599	0.492	0.506	-0.185	0.272	**0.851**	0.232	0.174	0.033
PB3Q49	0.582	0.541	0.403	-0.217	0.389	**0.861**	0.158	0.093	0.148
PB4Q50	0.573	0.609	0.428	-0.220	0.434	**0.752**	0.432	0.418	0.173
PIT1Q8	0.268	0.218	0.373	-0.099	**0.664**	0.266	0.054	0.173	0.057
PIT2Q9	0.333	0.318	0.226	-0.108	**0.831**	0.462	0.154	0.113	0.213
PIT3Q10	0.211	0.220	0.298	-0.034	**0.765**	0.377	0.091	0.064	0.147
PIT4Q11	0.117	0.162	0.225	0.035	**0.795**	0.265	0.009	0.078	0.225
SN1Q5	0.537	0.524	**0.901**	-0.050	0.360	0.528	0.427	0.420	0.012
SN2Q6	0.381	0.472	**0.830**	-0.071	0.258	0.464	0.259	0.273	-0.004
SN3Q7	0.473	0.471	**0.830**	-0.104	0.302	0.448	0.302	0.306	0.014
SQE1Q12	0.304	0.465	0.293	-0.103	0.100	0.365	**0.911**	0.732	0.137
SQE2Q13	0.303	0.287	0.252	-0.275	0.028	0.201	**0.781**	0.653	0.083
SQE3Q14	0.236	0.420	0.368	-0.001	0.148	0.279	**0.845**	0.710	0.000
SQE4Q15	0.426	0.370	0.355	-0.441	0.083	0.190	**0.721**	0.553	0.145
SQR1Q16	0.292	0.303	0.369	-0.183	0.069	0.191	0.747	**0.887**	-0.040
SQR2Q17	0.291	0.341	0.425	-0.182	0.096	0.263	0.715	**0.883**	0.037
SQR3Q18	0.195	0.311	0.186	-0.059	0.194	0.210	0.579	**0.744**	0.133
VOL1Q19	0.182	0.132	-0.044	-0.215	0.298	0.224	0.030	-0.063	**0.701**
VOL2Q20	-0.051	-0.110	-0.287	-0.051	0.112	0.020	-0.086	-0.207	**0.276**
VOL3Q21	0.087	0.013	-0.042	-0.219	0.299	0.159	-0.028	-0.075	**0.479**
VOL4Q51	0.161	0.189	-0.122	-0.101	0.099	0.015	0.070	-0.006	**0.883**

One of the differences between the Non-User Group data and the User Group data related to the construct of Voluntariness where dissimilar attributes were found to be more acceptable for the Non User Group than those assigned to the same construct for actual ITC users. For the Non-User Group, the Voluntariness construct achieved the required values for both reliability and construct validity as represented by VOL2Q19 and VOL4Q51. The Non-User Group measurement model was fine-tuned with a few additional changes including the removal of PIT1Q8 (.664) and the removal of attributes AT5Q26, AT3Q24, and BI2Q29, which did not meet the range of the outer loadings scores that all other attributes that were assigned to the construct fell within (Chin, 2010).

An additional check was made regarding the higher cross loadings between Attitude Intentions toward Use and Behavioral Intentions toward Use after the removal of AT5Q26, AT3Q24, and BI2Q29. The model reached acceptable differences in relation to individual attribute comparisons between the assigned and unassigned constructs (Table 4.17).

Table 4.17: Comparison Non-User Attitude Intention and Behavioral Intention toward Use Loadings

Latent Variable (LV)	ATIU Outer Loads (OL)	ATIU OL% as an assigned attribute	ATIU xLoad w/BITU (XL)	ATIU xLoad% as an Unassigned Attribute	Difference Shared Variance (SV) % Between
AT1Q22	0.932	0.869	0.756	0.572	0.297
AT2Q23	0.923	0.852	0.764	0.584	0.268
AT4Q25	0.924	0.853	0.792	0.627	0.226
AT6Q27	0.911	0.830	0.763	0.582	0.248
Latent Variable (LV)	BITU Outer Loads (OL)	BITU OL% as an assigned attribute	BITU xLoad w/ATIU (XL)	BITU xLoad% as an Unassigned Attribute	Difference Shared Variance (SV) % Between
BI1Q28	0.955	0.911	0.771	0.594	0.317
BI3Q30	0.934	0.872	0.803	0.644	0.228

Finally, the Service Quality Empathy and Service Quality Responsiveness had a similar condition as to what was found in the User Group model. The Non-User Group model required the use of a second order construct as well.

After the aforementioned adjustments to the model, the Non-User Group measurement model's items were examined for reliability and validity. The validation of these analysis results for the model's construct, including the completion of the related reliability and discriminant validity tests, are found in the table below (Table 4.18).

Table 4.18: Final Non-User Group Measurement Model Confirmatory Factor Analysis Values

	CR[a]	AVE[b]	ATIU	BITU	CWSN	NEGB	PIIT	POSB	SQ-2ND ORD[c]	SQEMP	SQRESP	VOL
Attitude toward Intention	0.963	0.839	0.839									
Behavioral Intention	0.972	0.946	0.825	0.946								
Co-Worker Social Norms	0.890	0.729	0.522	0.574	0.729							
Negative Beliefs	0.957	0.847	-0.464	-0.301	-0.085	0.847						
Personal Innovativeness toward IT	0.867	0.685	0.275	0.299	0.297	-0.061	0.685					
Positive Beliefs	0.907	0.711	0.671	0.667	0.563	-0.239	0.464	0.711				
SQ Higher Order	0.920	0.624	0.354	0.454	0.410	-0.218	0.112	0.308	0.624			
Service Quality Empathy	0.890	0.670	0.359	0.473	0.384	-0.234	0.111	0.318	0.966	0.670[d]		
Service Quality Responsiveness	0.878	0.708	0.309	0.378	0.398	-0.174	0.098	0.259	0.937	0.815	0.708[d]	
Voluntariness	0.854	0.745	0.180	0.185	-0.103	-0.177	0.266	0.119	0.017	0.061	-0.043	0.745

a. Composite Reliabilty (CR) representing internal consistency, minimum threshold is >.600

b. Average Variance Extracted (AVE) as an indicator of acceptable discriminant validity when >.50

c. SQ-2nd Order combined as a higher order component for Service Quality Empath and Service Quality Responsiveness

d. Lower order components no longer required to achieve discriminant validity

Pooled-Group Construct Validity. Finally, the pooled data set was also reviewed and similar conditions in the measurement model were discovered with those identified within the User Group data set. As mentioned earlier in the chapter, the pooled data's construct reliability was not supported in the initial review by either the Cronbach's Alpha or the Composite Reliability (CR) assessment. The pooled data is provided below (Table 4.19). Based upon the initial review of this data set, the immediate concerns included Voluntariness, Actual Use, and the Service Quality constructs. Since the intention of the study was to discover and discuss any recognizable differences between Users and Non-User's perceptions surrounding their behavioral intentions, no further measurement analysis of the pooled data was required. Only the User and Non-Users Groups' measurement models were updated and confirmed ready for structural analysis (further discussion on group differences can be found in Appendix C).

Table 4.19: Loadings and Cross Loadings for 144 Pooled

N=144: Loads and Cross Loads										
	ATT	**AU**	**BITU**	**CWSN**	**NEGB**	**PIIT**	**POSB**	**SQEMP**	**SQRESP**	**VOLU**
AT1Q22	**0.943**	0.644	0.800	0.494	-0.348	0.266	0.617	0.316	0.306	-0.226
AT2Q23	**0.925**	0.626	0.777	0.470	-0.429	0.340	0.602	0.383	0.348	-0.246
AT3Q24	**0.891**	0.662	0.838	0.519	-0.344	0.349	0.632	0.460	0.390	-0.201
AT4Q25	**0.939**	0.669	0.820	0.500	-0.425	0.333	0.602	0.403	0.372	-0.228
AT5Q26	**0.839**	0.638	0.711	0.425	-0.319	0.274	0.566	0.403	0.397	-0.220
AT6Q27	**0.927**	0.667	0.812	0.475	-0.321	0.341	0.634	0.347	0.319	-0.275
AU1Q31	0.529	**0.638**	0.562	0.465	-0.168	0.244	0.497	0.391	0.303	-0.164
AU2Q32	0.626	**0.866**	0.647	0.630	-0.318	0.401	0.585	0.345	0.317	-0.346
AU3Q33	0.518	**0.799**	0.553	0.492	-0.142	0.314	0.537	0.322	0.293	-0.393
AU4Q34	0.583	**0.785**	0.637	0.492	-0.220	0.337	0.525	0.319	0.350	-0.272
AU5Q35	0.545	**0.837**	0.593	0.514	-0.242	0.388	0.488	0.432	0.402	-0.427
BI1Q28	0.830	0.743	**0.951**	0.530	-0.292	0.364	0.613	0.443	0.399	-0.262
BI2Q29	0.819	0.691	**0.923**	0.475	-0.295	0.326	0.567	0.421	0.411	-0.303
BI3Q30	0.810	0.719	**0.949**	0.475	-0.293	0.384	0.591	0.425	0.370	-0.249
NB1Q1	-0.298	-0.199	-0.234	-0.015	**0.854**	-0.082	-0.096	-0.258	-0.223	0.016
NB2Q2	-0.309	-0.123	-0.185	0.035	**0.861**	-0.022	-0.078	-0.211	-0.181	-0.075
NB3Q3	-0.401	-0.353	-0.351	-0.220	**0.854**	-0.183	-0.203	-0.271	-0.248	0.135
NB4Q4	-0.363	-0.263	-0.285	-0.078	**0.904**	-0.072	-0.146	-0.230	-0.230	0.047
PB1Q47	0.571	0.602	0.546	0.468	-0.135	0.346	**0.870**	0.227	0.148	-0.167
PB2Q48	0.576	0.584	0.506	0.422	-0.128	0.337	**0.853**	0.308	0.267	-0.225
PB3Q49	0.518	0.492	0.472	0.347	-0.091	0.313	**0.836**	0.160	0.098	-0.131
PB4Q50	0.578	0.567	0.581	0.409	-0.171	0.448	**0.803**	0.403	0.343	-0.225
PIT1Q8	0.336	0.393	0.346	0.254	-0.077	**0.797**	0.351	0.179	0.217	-0.200
PIT2Q9	0.303	0.355	0.321	0.230	-0.074	**0.790**	0.414	0.190	0.141	-0.051
PIT3Q10	0.222	0.282	0.268	0.172	-0.077	**0.778**	0.306	0.159	0.120	-0.104
PIT4Q11	0.231	0.328	0.264	0.148	-0.128	**0.829**	0.286	0.174	0.204	0.010
SN1Q5	0.522	0.540	0.477	0.897	-0.088	0.294	0.442	0.388	0.397	-0.244
SN2Q6	0.383	0.535	0.432	0.856	-0.078	0.147	0.364	0.246	0.268	-0.294
SN3Q7	0.462	0.646	0.455	0.847	-0.075	0.223	0.468	0.305	0.252	-0.209
SQE1Q12	0.308	0.383	0.385	0.261	-0.182	0.174	0.307	**0.876**	0.696	-0.216
SQE2Q13	0.355	0.297	0.343	0.287	-0.344	0.145	0.214	**0.809**	0.710	-0.080
SQE3Q14	0.315	0.394	0.396	0.333	-0.096	0.282	0.311	**0.844**	0.719	-0.264
SQE4Q15	0.420	0.431	0.380	0.316	-0.322	0.122	0.250	**0.768**	0.628	-0.114
SQR1Q16	0.332	0.353	0.334	0.296	-0.243	0.144	0.156	0.715	**0.851**	-0.172
SQR2Q17	0.394	0.413	0.396	0.397	-0.256	0.182	0.257	0.754	**0.893**	-0.194
SQR3Q18	0.234	0.285	0.311	0.174	-0.133	0.218	0.232	0.615	**0.757**	-0.148
VOL1Q19	0.201	0.162	0.148	0.119	-0.083	0.150	0.243	0.129	0.076	**-0.150**
VOL2Q20	-0.174	-0.349	-0.228	-0.220	0.015	-0.085	-0.094	-0.159	-0.200	**0.847**
VOL3Q21	-0.028	-0.067	-0.085	-0.024	0.014	0.055	-0.025	-0.057	-0.044	**0.518**
VOL4Q51	-0.060	-0.173	-0.066	-0.225	-0.058	0.040	-0.105	-0.025	-0.012	**0.559**

Structural Equation Model Analysis

The following sections provide a path analysis for each of the structural models, preceded by a review of the Personal Innovativeness construct as a moderator between Attitude Intentions and Behavioral Intentions toward Use. The path analysis begins with a review of the Variance Inflation Factor (VIF) scores for both models preceded by an assessment of the path coefficients. The path coefficient analysis includes a review of the Coefficient of Determination (R^2), the Coefficient of Relevance (Q^2), and the evaluation of corresponding effect strength associated with each (f^2 and q^2). The overall hypotheses are presented as supported (SPT) or not supported (NS) based upon the observed results found during the structural analysis procedure.

Variance Inflation Factors. The prepared measurement models for both User and Non-User Groups are now ready for hypothesis testing. Moving forward with the structural path analysis, we begin with a check of the Variance Inflation Factor Scores for each of the groups. The calculation of the VIFs was the method used to check for collinearity and multicollinearity conditions among the latent variables. Using SPSS Statistics v23 output, the VIF or tolerance values are presented in the table below and deemed acceptable for both models with no score being greater than 5.000 (Tables 4.20 and 4.21).

Table 4.20: User Group Variance Inflation Factor Scores

	Collinearity Statistics	
	Tolerance	VIF
NB1Q1	.548	1.824
NB2Q2	.422	2.370
NB4Q4	.464	2.155
	Collinearity Statistics	
	Tolerance	VIF
SN2Q6	.449	2.226
SN3Q7	.584	1.712
SN1Q5	.479	2.086
	Collinearity Statistics	
	Tolerance	VIF
AU3Q33	.339	2.946
AU4Q34	.751	1.331
AU5Q35	.519	1.927
AU2Q32	.452	2.215
	Collinearity Statistics	
	Tolerance	VIF
SQE1Q12	.376	2.661
SQE2Q13	.318	3.140
SQE3Q14	.293	3.415
SQE4Q15	.455	2.198
SQR1Q16	.489	2.046
SQR2Q17	.262	3.823
SQR3Q18	.508	1.969

	Collinearity Statistics	
	Tolerance	VIF
PB1Q47	.532	1.881
PB2Q48	.534	1.871
PB3Q49	.548	1.826
PB4Q50	.571	1.752
	Collinearity Statistics	
	Tolerance	VIF
AT1Q22	.209	4.783
AT2Q23	.284	3.527
AT3Q24	.326	3.067
AT4Q25	.248	4.025
	Collinearity Statistics	
	Tolerance	VIF
BI2Q29	.347	2.881
BI3Q30	.347	2.881
	Collinearity Statistics	
	Tolerance	VIF
VOL2Q20	.815	1.227
VOL3Q21	.815	1.227
	Collinearity Statistics	
	Tolerance	VIF
PIT1Q8	.630	1.588
PIT4Q11	.630	1.588

One construct, Attitude Intentions, within the User Group VIFs flagged a collinearity issue. The AT6Q27 attribute (6.821) exceeded the 5.000 target and was removed from the measurement model without disturbing the discriminant or convergent validity. For the Non-User Group data set, the VIFs were high for AT1Q22 (6.765) and NB4Q4 (6.170) signaling potential issues with collinearity. Both were removed, again without disturbing discriminant or convergent validity for the measurement model.

Table 4.21: Non-User Group Variance Inflation Factor Scores

	Collinearity Statistics	
	Tolerance	VIF
NB1Q1	.261	3.836
NB2Q2	.320	3.129
NB3Q3	.370	2.701
	Collinearity Statistics	
	Tolerance	VIF
SN1Q5	.447	2.235
SN2Q6	.577	1.732
SN3Q7	.575	1.739
	Collinearity Statistics	
	Tolerance	VIF
SQE1Q12	.265	3.770
SQE2Q13	.453	2.208
SQE3Q14	.313	3.199
SQE4Q15	.574	1.742
SQR1Q16	.314	3.185
SQR2Q17	.352	2.839
SQR3Q18	.596	1.679
	Collinearity Statistics	
	Tolerance	VIF
VOL1Q19	.759	1.318
VOL4Q51	.759	1.318

	Collinearity Statistics	
	Tolerance	VIF
PB1Q47	.342	2.927
PB2Q48	.421	2.375
PB3Q49	.429	2.333
PB4Q50	.642	1.558
	Collinearity Statistics	
	Tolerance	VIF
AT2Q23	.231	4.325
AT4Q25	.243	4.115
AT6Q27	.259	3.860
	Collinearity Statistics	
	Tolerance	VIF
PIT2Q9	.658	1.520
PIT3Q10	.618	1.617
PIT4Q11	.586	1.708
	Collinearity Statistics	
	Tolerance	VIF
BI1Q28	.203	4.932
BI3Q30	.203	4.932

Coefficient of Determination. The target size for the Coefficient of Determination (R^2) is often determined by the previous research within the area of study. Recent studies associated with IT Consumerization, along with research in the area of intention and the actual use of innovation have produced R^2 values ranging from .352 and .790 for the constructs of intention and actual use (Kuo & Yen, 2009; Lebek et al. 2013; Loose et al., 2013; Ortbach 2013). Below are the applicable R^2 values for the current research project. First, each path coefficient between the mediating variables was assessed (Users and Non-Users) and examined for the predictive accuracy of the paths using the bootstrapping technique available in Smart PLS.

Table 4.22: Coefficient of Determination Values

Non-User Variables	**R2**
Attitude toward Intention to Use	0.538
Behavioral Intention to Use	0.668
User Group Variables	**R2**
Attitude toward Intention to Use	0.324
Behavioral Intention to Use	0.607
Actual Use	0.390

Based upon similar research in the field of IT Consumerization, these values appear on a par with other similar studies.

Path Analysis of Path Coefficients. The path coefficients represent the relationships hypothesized by the researcher. The t-values are calculated to check the likelihood that the relationship that has been determined by the data set has a probability it exists not by chance but more so by the predictive relationship that truly exists between them. Below is the output data used to assess the probabilities and make a determination of supported or not supported relationships within each of the models (Table 4.23 & Table 4.24).

Table 4.23: Path Coefficient Analysis on User Group Data

75 User Group	Path Coefficient	t Value	Significance Level[a]
ATIU -> BITU	0.684	8.358	***
BITU -> AU	0.624	14.048	***
CWSN -> BITU	-0.051	0.835	NS
NEGB -> ATIU	-0.291	4.581	***
PIIT -> BITU	0.072	1.431	NS^
POSB -> ATIU	0.493	9.210	***
SQ-2NDORD -> BITU	0.128	1.771	*
SQEMP -> SQ-2NDORD	0.585	38.733	NA
SQRESP -> SQ-2NDORD	0.450	26.172	NA
VOL -> BITU	-0.083	1.541	NS^

Note

*t-value of 1.65 (significance level of 10%)

**t-value of 1.96 (significance level of 5%)

***t-value of 2.57 (significance level of 1%)

a. Probability of erroneous relationship (due to error)

^ = Not Significant, however additional sample may change level of significance

The relationships identified as supported in the model were: Intentions, Negative and Positive Beliefs, and Service Quality as predictors of Actual Use. Further clarification regarding these results will be provided later in this chapter.

For the Non-User Group, the path coefficients were assessed in a similar fashion. The relationships that were supported in the model include Attitude Intentions, Negative and Positive Beliefs, Co-Worker Social Norm, Service Quality, and Voluntariness as an influence upon Behavioral Intention to Use. Table 4.24 provides the path coefficients, t-values, and reference to supported and not supported relationships for Non-User Groups.

Table 4.24: Path Coefficient Analysis on Non-User Group Data

69 Non User Group	Path Coefficient	t Value	Significance Level [a]
ATIU -> BITU	0.588	7.757	***
CWSN -> BITU	0.183	2.660	***
NEGB -> ATIU	-0.344	6.089	***
PIIT -> BITU	0.068	0.953	NS
POSB -> ATIU	0.582	10.051	***
SQ-2NDORD -> BITU	0.130	2.295	**
SQEMP -> SQ-2NDORD	0.603	27.376	NA
SQRESP -> SQ-2NDORD	0.445	21.846	NA
VOL -> BITU	0.142	2.053	**

Note
*t-value of 1.65 (significance level of 10%)
**t-value of 1.96 (significance level of 5%)
***t-value of 2.57 (significance level of 1%)
a. Probability of erroneous relationship (due to error)
^ = Not Significant, however additional sample may change level of significance

Predictive Accuracy and Relevance. The predictive strength of each model was also assessed via the t-Value calculation using the bootstrapping method in Smart PLS and based upon each path coefficient's f^2 values. The f^2 coefficients represent the effect size that each relationship has within the applicable model. The t-values are available from the bootstrapping procedure. The relationships between the latent variables were hypothesized as either predictor variables represented by exogenous variables or as endogenous variables being influenced by the exogenous variables in the model. The f^2

value represents the strength of predictive accuracy for the individual relationships relative to all other relationships within the overall models' path coefficients.

The predictive relevance for each model is determined through the Q2 score and is calculated via the statistical blindfolding procedure where values greater than 0 indicate an acceptable score for relevance (Table 4.25). The Q2 scores were acceptable for both sample groups and then assessed for the effect size related to predictive relevance.

Table 4.25: Predictive Relevance for User Group and Non-User Group

User Group Variables	**Q2 Values**
Attitude Intentions to Use	0.271
Behavioral Intentions to Use	0.490
Actual Use	0.220
Non-User Group Variable	**Q2 Values**
Attitude Intentions to Use	0.439
Behavioral Intention	0.564

Both the f^2 (accuracy) and q^2 (relevance) values represent the effect size or strength of the User and Non-User Group data associated with the structural model. The User Group data structural model is assessed for both relevance and accuracy and is presented in Table 4.26 and Table 4.27. The effect size is included as having low, medium, or large effect. The User Group sample effects analysis corroborated the results of the hypothesized relationships already noted as part of the structural equation model.

Table 4.26: User Group Predictive Accuracy Analysis (f^2)

Endogenous ATT	R2 included	R2 excluded	R2inc - R2exc	1-R2	f2 Value	f2 Result
Negative Beliefs	0.324	0.239	0.085	0.676	0.126	Small
Positive Beliefs	0.324	0.081	0.243	0.676	0.359	Large
Endogenous BITU	R2 included	R2 excluded	R2inc - R2 exc	1-R2	f2 Value	f2 Result
Attitude Intentions	0.607	0.297	0.310	0.393	0.789	Large
Social Norms	0.607	0.605	0.002	0.393	0.005	No effect
Service Quality	0.607	0.595	0.012	0.393	0.031	Small
Voluntariness	0.607	0.600	0.007	0.393	0.018	No effect
Personal Innovativeness	0.607	0.602	0.005	0.393	0.013	No effect
Endogenous AU	R2 included	R2 excluded	R2inc - R2 exc	1-R2	f2 Value	f2 Result
Behavioral Intentions	0.390	0.000	0.390	0.610	0.639	Large

Table 4.27: User Group Predictive Relevance Analysis (q^2)

Endogenous ATT	Q2 included	Q2 excluded	Q2inc - Q2exc	1-Q2	q2 Value	q2 Result
Negative Beliefs	0.271	0.200	0.071	0.729	0.097	Small
Positive Beliefs	0.271	0.067	0.204	0.729	0.280	Large
Endogenous BITU	Q2 included	Q2 excluded	Q2inc - Q2exc	1-Q2	q2 Value	q2 Result
Attitude Intentions	0.490	0.218	0.272	0.510	0.533	Large
Social Norms	0.490	0.493	-0.003	0.510	-0.006	No effect
Service Quality	0.490	0.249	0.241	0.510	0.473	Large
Voluntariness	0.490	0.488	0.002	0.510	0.004	No effect
Personal Innovativeness	0.490	0.499	-0.009	0.510	-0.018	No effect
Endogenous AU	Q2 included	Q2 excluded	Q2inc - Q2exc	1-Q2	q2 Value	q2 Result
Behavioral Intentions	0.220	0.000	0.220	0.780	0.282	Large

The Non-User Group data set is found in Table 4.28 and Table 4.29; one provides the effect size for predictive accuracy and the other for predictive relevance for the data set. The predictive strengths detected in the Non-User Group sample were small but were still reflected as corresponding support for the hypothesis.

Table 4.28: Non-User Group Predictive Accuracy Analysis (f^2)

Endogenous ATT	R2 included	R2 excluded	R2inc - R2exc	1-R2	f2 Value	f2 Result
Negative Beliefs	0.538	0.425	0.113	0.462	0.244589	Medium
Positive Beliefs	0.538	0.213	0.325	0.462	0.703463	Large
Endogenous BITU	R2 included	R2 excluded	R2inc - R2 exc	1-R2	f2 Value	f2 Result
Attitude Intentions	0.668	0.439	0.229	0.332	0.689759	Large
Social Norms	0.668	0.647	0.021	0.332	0.063253	Small
Service Quality	0.668	0.654	0.014	0.332	0.042169	Small
Voluntariness	0.668	0.651	0.017	0.332	0.051205	Small
Personal Innovativeness	0.668	0.664	0.004	0.332	0.012048	No effect

Table 4.29: Non-User Group Predictive Relevance Analysis (q^2)

Endogenous ATT	Q2 included	Q2 excluded	Q2inc - Q2 exc	1-Q2	q2 Value	q2 Result
Negative Beliefs	0.438	0.370	0.068	0.562	0.121	Small
Positive Beliefs	0.438	0.153	0.285	0.562	0.507	Large
Endogenous BITU	Q2 included	Q2 excluded	Q2inc - Q2 exc	1-Q2	q2 Value	q2 Result
Attitude Intentions	0.564	0.362	0.202	0.436	0.463	Large
Social Norms	0.564	0.560	0.004	0.436	0.009	No effect
Service Quality	0.564	0.558	0.006	0.436	0.014	No effect
Voluntariness	0.564	0.572	-0.008	0.436	-0.018	small
Personal Innovativeness	0.564	0.597	-0.033	0.436	-0.076	Small

Moderating Effects Analysis. The User Group data set and Non-Users Group data set were analyzed for a potential moderating effect associated with Personal Innovation toward IT. Neither data set identified PIIT to have a moderating effect over the predictive influence that Attitude Intentions toward Use has upon Behavioral Intentions toward Use. The interaction term was not significant for either Users (t=1.510) or Non-User (t=1.118) groups.

Table 4.30: PIIT Moderator Interaction Effect Analysis Output

69 Non-Users	**Path Coefficients**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**Standard Error (STERR)**	**T Statistics (|O/STERR|)**
AITU -> BITU	0.573	0.585	0.060	0.060	9.540
AITU * PIIT -> BITU	-0.121	-0.087	0.108	0.108	1.118^
75 Users	**Path Coefficients**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**Standard Error (STERR)**	**T Statistics (|O/STERR|)**
ATIU -> BITU	0.637	0.647	0.076	0.076	8.336
ATIU * PIIT -> BITU	0.148	0.104	0.098	0.098	1.510^

Note

*t-value of 1.65 (significance level of 10%)

**t-value of 1.96 (significance level of 5%)

***t-value of 2.57 (significance level of 1%)

^ = Not Significant, however additional sample may change level of significance

Using Smart PLS, the interaction effect was calculated for the interaction term (AITU*PIIT) for both Users and Non-Users group data. The path coefficient, although not significant for either group, the Users had a positive coefficient while the Non-User group had a negative coefficient. Similar to other relationships examined in this research study, the sample size was assessed in a power analysis. Increased sampling may provide an opportunity for a more pronounced effect to be identified within the research's structural model. If the directional indicator holds true, the relationship between Attitude Intention toward Use and Behavioral Intention toward Use would decease as a result of stronger Personal Innovativeness perceptions for the Non-User group. For the User group data which has a positive coefficient means that as the Personal Innovativeness toward IT perceptions increased, then the Attitude Intentions toward Use construct would become less of a predictor of the Behavioral Intentions toward Use construct.

Power Analysis. According to Cohen (1988), to have an 80% chance (probability of finding true significance for each of the hypothesized relationships) of avoiding a Type II error in the research design, a target sample size should be considered when gathering the corresponding data. If the researcher is looking for an R^2 of at least .500 with a 5% or less chance of error (probability of an erroneous relationship between variables), then the appropriate sample size can be determined via a power analysis. The researcher determines how many relationships will be assessed within the model and what effect sizes were detected in the already tested relationships from previous research studies. Using statistical tools, such as GPOWER (Erdfelder, Faul, & Buchner, 1996 per Keppel

and Wickens, 2004), the researcher can make a determination of the necessary sample size to meet the 80% power level as suggest by Cohen (1988).

The analysis presented for the current project had identified some Not Supported relationships for both User Group and Non-User Group data. The User Group data would require a sample size of 318 respondents to confirm that a true relationship and hypotheses conclusions were reached. In addition, the relationship between Personal Innovation and Behavioral Intention to Use would require a User Group sample size of approximately144 respondents. With Non-User Group respondents, the relationship between Personal Innovation toward IT and Behavioral Intention to Use, a target sample size of 300 would be necessary to have an 80% chance that true results were represented by the relationship hypothesized in the study. A discussion of these potential opportunities, along with other observations, is provided in Chapter 5.

Summary of Hypotheses Supported and Not Supported. The relationships were analyzed using structural equation modeling techniques; the results are summarized below in the Table 4.31 (below).

Table 4.31 Hypotheses Results for IT Consumerization Study

HYP	Description of Hypotheses [b]	USER GROUP [a]	NON-USER GROUP [a]
H1a	Privacy and Security concerns over personal information loss or misuse will negatively influence employee's attitude toward behavioral intentions to use IT Consumerization service in the workplace.	SPT	SPT
H1b	Perceived performance improvements will have a positive influence on the user's attitude toward the behavioral intention to use IT Consumerization in his/her workplace.	SPT	SPT
H2	Personal Innovativeness moderates the relationship between the attitude towards the use of the service and the behavioral intention to use IT Consumerization in the employee's workplace.	NS	NS
H3	Co-workers who use IT Consumerization in the workplace will positively impact an employee's behavioral intention to use IT Consumerization in the workplace.	NS	SPT
H4a	An employee who perceives high levels of empathy from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.	SPT	SPT
H4b	An employee who perceives high levels of responsiveness from the IT Department will have a strong employee behavioral intention to use IT Consumerization in the workplace.	SPT	SPT
H4c	Perceived voluntariness will have a positive influence on the employee's behavioral intention to use IT Consumerization in his/her workplace.	NS	SPT
H5	The more favorable the attitude intentions toward IT Consumerization use in the workplace, the higher degree of behavioral intention to use.	SPT	SPT
H6	Behavioral intention to use IT Consumerization in the workplace leads to confirmed usage.	SPT	NA

Note:
a. SPT = Supported and NS = Not Supported
b. Description of the ITC hypothesized relationships

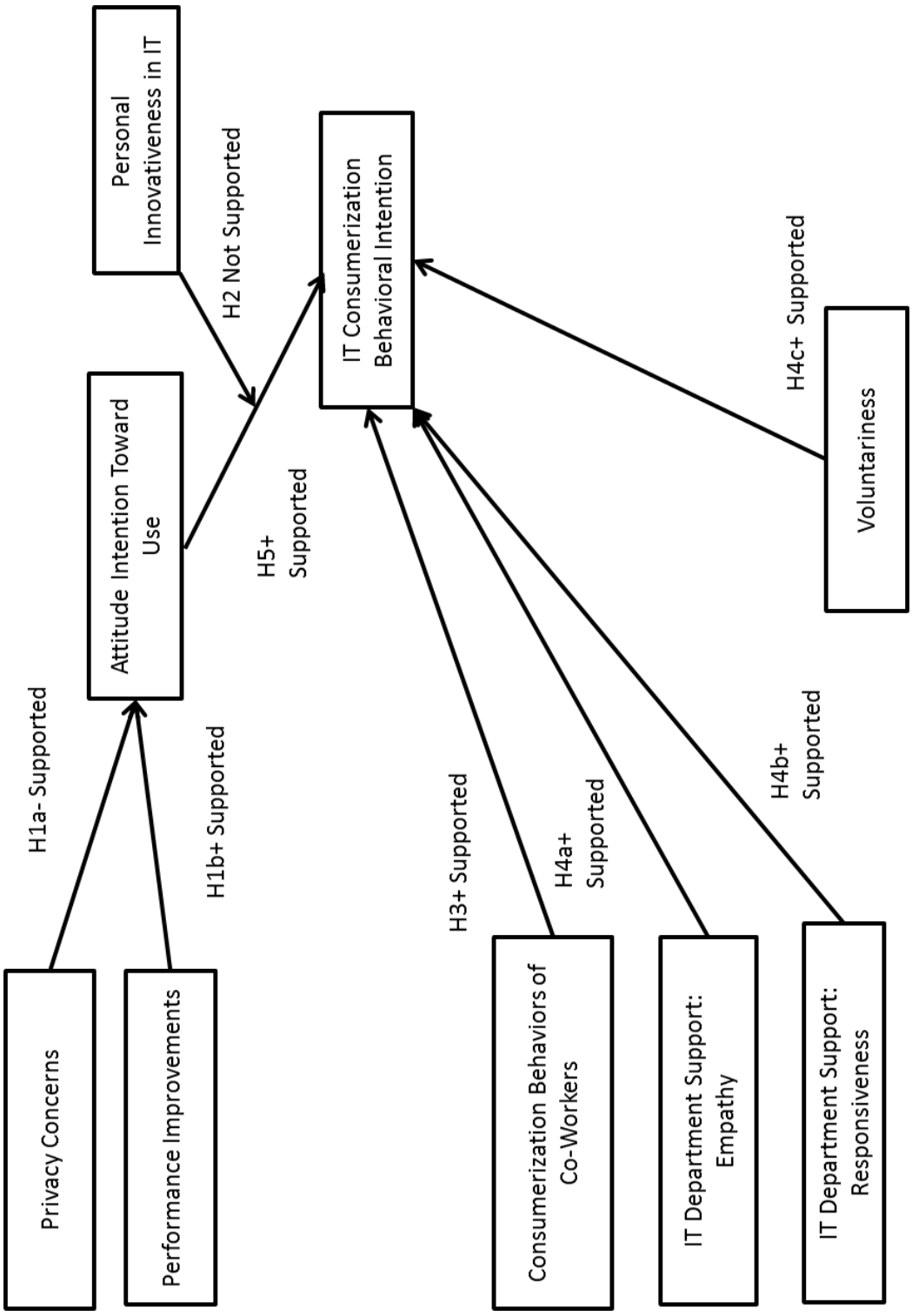

Figure 4.4: Non-User Group Supported and Non Supported Hypotheses

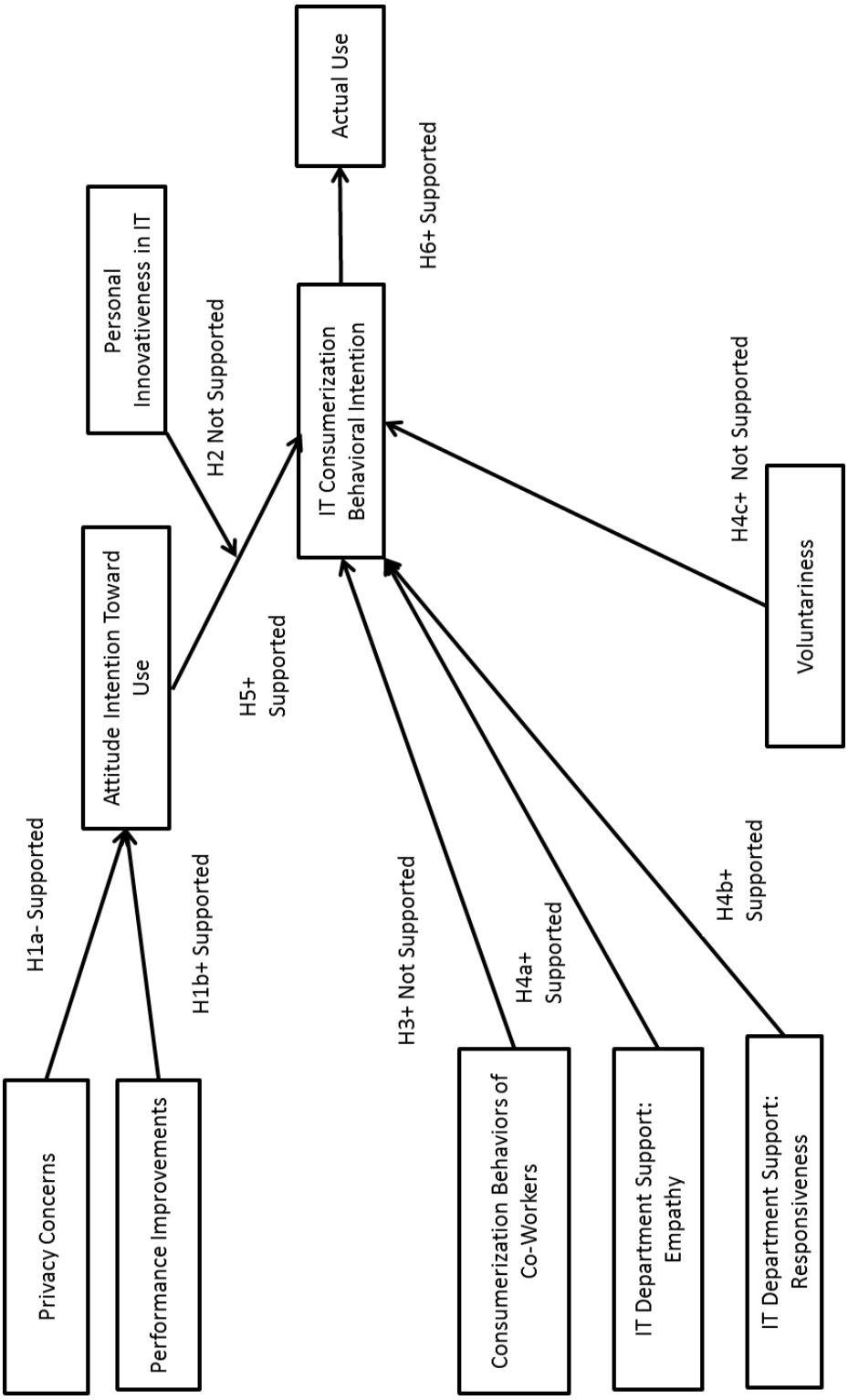

Figure 4.5: User Group Supported and Non Supported Hypotheses

CHAPTER 5

The Theory of Planned Behavior provides a framework for analyzing behavioral antecedents and includes beliefs and perceptions which drive both attitude and behavioral intentions, as well as behavioral actions. The research project surveyed both Users and Non-Users for their perceptions of a technology innovation. The project leveraged the TPB theoretical framework as a model for developing hypotheses about the potential relationships within the current IT Consumerization research work stream. The goal was to introduce new predictors of intention to use and actual use of the IT Consumerization service.

Discussion of Results

Practitioners have displayed an interest in gaining subscribers to the IT Consumerization Service and transforming the community of Non-Users into an organization of Users. The employee's acceptance of this new style of workplace services helps to influence others to begin using the IT Consumerization innovation. This change directly reduces capital expense dollars through the reduction of spending on hardware and corresponding maintenance. For researchers who are interested in studying the use of an IT Consumerization service, these results draw attention to the significance of understanding how the predictors of intentions can change before and after the individual's decision to use.

Researchers who are examining a mixed community of Users and Non-Users need to ascertain that each respondent is confirmed into one specified group through some type of research design criteria beyond a simple yes/no indicator. A mindful use of

the system could be used for comparison with a mindful response on the questionnaire; the questionnaire design should therefore offer the respondent an opportunity to answer "mindfully" without any requirement to answer an excessive amount of items. Without the respondent's confirmation that answers are based upon either potential or actual experience, future results may be clouded by overlapping perceptions between these two different groups if the data was inadvertently pooled together. Researchers of Use and Non-Use behaviors might also consider the continued examination of actual users of IT Consumerization Services from the perspective of a Personal Innovativeness toward IT. The idea that Non-Users are influenced by existing Users, in conjunction with the potential moderating effect of personal innovativeness identified in the User group data, may lead to new ideas in research models which examine attitude and behavioral intentions leading to actual use.

The following sections will discuss the research results with both practitioners and academics in mind. After a discussion on Service Quality, the paper will move forward with a discussion on results associated with other relationships found within the models. These results will be of particular interest to individuals desiring to learn more about influences impacting human intentions leading to actual use. Current research on the predecessors of intentions for the User group versus the intentions for the Non-User group has demonstrated different results. The discussion that follows is underpinned with an intent to motivate the reader to believe that a positive opportunity for learning and improving future research result will lead to a behavioral intention to continue the forward momentum of the research stream into actual actions.

Service Quality. The construct of Service Quality, as found in consumer research, has been linked with the decision to use. If the buyer's perceptions are real, any improvements on the target audience's perceptions of service quality would result ultimately in the consideration of use, as opposed to non-use, by more consumers. It seems to follow that this condition would therefore influence the intentions to use a service in the scenario whereby the employee is the consumer and IT Consumerization is the service. In the case of User and Non-User Group data, both sets of respondents' behavioral intentions were influenced by the positive perception of service quality indicators.

Service quality perceptions, which shed some additional light upon the decision to use or not to use, should be considered in the assessment of behavioral intention predictors. Practitioners are urged to focus upon increasing the employee's positive perception of the IT support team's service quality indicators, particularly those associated with empathy and responsiveness. Improved perceptions will persuade some individuals to make the decision to start using the service. The business organizational leadership can influence the initiation of use and the continued use of the workplace products by improving the perceptions of quality support services available for IT Consumerization Services, and thereby increase the community of users.

Service quality was positioned in the research model as a construct representing perceived behavioral control, which is the representation of conditions whereby the respondent recognizes she/he is not able to control the actions of others, but his/her behavioral intentions, decisions, and actions are nonetheless influenced by his/her perceptions of these outside actions. In the model, Voluntariness and Co-Worker Social

Norms were also included in the models as representations of perceived behavioral control. Only the Non-User Group data indicated support for the relationships between these constructs and behavioral intentions toward use of the IT Consumerization services. Perhaps Voluntariness is no longer a consideration for Users since they are already users, whereas Non-Users could still be influenced by the no-pressure requirement (or Voluntariness) that would result in the decision to use. Additionally, the influence of the Co-Worker Social Norm construct might relate to the perception that a community is available to help if the decision to use is made.

As the research data indicated, the Non-User behavioral intention toward use illustrated a corresponding increase with the likelihood that co-workers are using the service. An organization that is looking to transform their workplace services, as well as those of their client, must make an effort to build a community of Users from the population of Non-Users. Based upon the results of this study, an appropriate consideration for IT employers who are marketing the service to their employees as a target audience is to promote the connection of Non-Users with the already established community of Users. As a result, they will build the community of users, set the pace for new employees to use their personal devices, and begin to reduce the capital expense that comes with the procurement of new hardware.

The challenge is to engage the ITC User community in the process of improving subscribership to the service. Since User employees' behavioral intentions leading to actual use appears to no longer be influenced by their co-worker behaviors (Users or Non-Users), some other mechanism for achieving this improvement might be necessary such as personal interest in innovation.

Personal Innovativeness toward Information Technology. For this study, the research model hypothesized that employees who report a sense of innovativeness toward information technology would have stronger attitudinal intentions and therefore greater behavioral intentions toward use. Generally speaking, the responsible manager in charge of the potential or existing employee would benefit from identifying employees with a greater sense of personal innovativeness towards IT. If the organization is looking to initiate or promote an IT Consumerization Service, individual interest may increase and actual use promoted for those employees that have a sense of personal innovativeness toward technology.

Neither the Users nor the Non-Users Group data demonstrated that the construct of Personal Innovativeness toward Information Technology had a moderating effect upon behavioral intentions. However, the data for the Users of the service suggests, as stated in the hypothesized relationship, that significant results could be demonstrated with an increased sample size. As mentioned in Chapter Four, the power analysis explains the need for additional sampling to provide some assurance that the unsupported results are not a false negative (see Table 4.30). A consideration of the sample demographic may also be appropriate when assessing the Personal Innovativeness relationships.

The sample used in this study primarily included Information Technology Project Managers; thus conditions for perceiving Personal Innovativeness toward Information Technology could be quite different for engineers, or business analysts, or executive directors. When rolling out a new technology innovation in a business setting for use by employees, where the employer is looking to gain increased “consumer-ship” of an IT Consumerization Service, the target audience’s work role might be a consideration. A

less technologically savvy workforce, who now is faced with the decision to use IT Consumerization Services, may nonetheless have a strong perception of personal innovativeness which could potentially influence intentions toward use. Connecting those Users with a strong sense of personal innovativeness toward information technology to Non-Users with minimal perceptions of personal innovativeness might be an effective approach for improving the number of subscribers using the service.

As stated earlier, the relationship of Personal Innovativeness toward IT was not supported as a moderator of intentions for either group. But it was noted that more could be learned with an increased sample size and by targeting responses from an expanded work role audience. Future research would be necessary to examine the attitudinal intention of a larger sample, which would include an expanded work role audience in order to detect the influences upon behavioral intentions associated with actual use of IT Consumerization Services in the workplace. Such research would provide an opportunity to examine the differences between the perceptions of employees in various work roles who are exposed to using technology innovations. If the work role has an impact or is associated with personal innovativeness toward technology, then a more complex moderating condition may exist between attitude intention and behavioral intentions.

Actual Use. This research project was an opportunity to consider the intention of both Non-Users and Users toward an existing technology innovation available for use. The employees' perception of the service quality associated with IT Consumerization service provided by the IT Service Department was a significant influencer of behavioral intention for both groups. From a practitioner's perspective, building a community of ITC Users may create an organizational culture of acceptance toward the behavior of

using a personal device to complete work tasks. Because the perception of a co-worker's use is an influence upon Non-Users, Non-Users need to be connected to Users for promotion of the use of the service.

In spite of their influence, the User group may be difficult to engage in the promotion of subscribership. The influence of organizational cultures and workforce cultures on use of a new technology or information service should be considered since understanding the variables which promote the expansion of use facilitates advance planning for marketing a new product or service within the organization or to the "new" set of customers. An aging workforce creates another dimension and dispersion between an older workforce and new employees entering the same work arena. The challenge is if members of the User group are primarily from a younger work force, older employees may not be particularly interested in connecting with the new/incoming members of the team. Use behaviors and the expectation of use experienced by the employee as communicated by the employer may change over time as the mix in the number of new and seasoned employees varies.

The research design must assure the separation of the User group from the Non-User group when self-reporting use. A manipulation check provided additional support to verify which group was being measured and evaluated for the predictive nature of the hypothesized relationships. This check improves the design for use in future research by academics and for consideration by practitioners. Researchers will need to separate the Users from the Non-Users, and should be transparent about attitude intentions toward use and behavioral intentions toward use results when using the TPB as a framework for studies that are examining actual use behavior toward technology innovation.

Positive and Negative Beliefs. Individual beliefs, described as antecedents to attitude intentions, were presented in the form of both anticipated positive opportunities and potential negative consequences. As anticipated by TPB, the hypothesized relationships for the belief perceptions of both groups as predictors of Attitudinal Intentions were supported in the IT Consumerization research model. Although the construct's indicators were similar for each model, the effect size and strength were different with regard to negative beliefs.

The User group's negative beliefs were less predictive based on the smaller effect size, while their positive beliefs indicated a larger effect size upon attitude intentions. On the other hand, the Non-User group's negative beliefs had a medium effect size as a predictor of attitudinal intentions toward a behavioral intention. For the Non-Users, this result might represent an oscillating decision, as well as an uncertainty with regard to related unknowns. This condition may be effecting the decision to use as a negative unknown more so than the positive unknowns. The reduction in negative uncertainty through the confirmation of positive experiences of the existing subscribed members could transform the Non-Users' positive beliefs and personal intentions into actual use, thereby increasing the number of the organization's overall ITC service users.

The decision to use an IT Consumerization service is a complex phenomenon since potential users (i.e. those in the Non-User Group) may have other considerations in mind beyond improved performance or concerns about personal security. It is also possible that an underlying condition may exist simply from the blurred lines between personal business and work role responsibilities. The merging cultures of personal lives and work roles could be in and of themselves key contributors to an individual's

oscillation about whether to accept or reject the IT Consumerization service. The interpretation of negative and positive beliefs identified in this study may drive future research for an expanded understanding of the effects of the uncertainty of the unknowns through the known experience of the existing user community. Understanding and reducing the employees' domain of unknowns, should increase the likelihood of human intentions leading to actual use of the available service.

Co-Worker Social Norms. The results from this study indicate that the perceptions of co-worker beliefs (social norms) influenced the intentions toward use of only the Non-User's group. These results demonstrate a small effect upon the overall structure of the research model. According to the TPB, the social norm factor should have some effect on human intentions; therefore, the results acquired from the Non-User group were as expected and did follow the underlying theory. The theoretical expectation that made the results from the User Group data interesting was the relationship between the perceptions of co-workers as an influence upon human intentions not being supported.

The lack of significance between the Co-Worker Social Norm and the Behavioral Intention toward Use constructs for the User Group dataset may be due to fewer uncertainties about the service. The lack of uncertainties may result from the User group's disinterest to seek out, or even acknowledge potential unknowns. If social norms do influence the individual's human intentions toward use, then some other "unknown factor" may apply to the group already engaging in use. This is an opportunity for continued research into how social norms effects behavioral intentions associated with continued use of a technology innovation.

Past research on intention to use IT Consumerization studies, where the construct of Co-Worker Social Norms was a latent variable, a strong influence on behavioral intention to use was identified (Kleijnen et al., 2004; Loose et al., 2013; Ortbach et al., 2013). One recognizable difference among these past studies on IT Consumerization and the results derived from the current study is the difference in the mean age and years of experience of the sample respondents. In the current study, the respondents were older and had more work experience. This factor may contribute to the small effect identified in the study of the Non-User's perceptions and the lack of significance with regard to the User group data altogether.

Voluntariness. The construct of voluntariness was included in the model as a representation of perceived behavioral control. It was hypothesized to influence behavioral intentions leading to actual use of the IT Consumerization Service. Recent research considered voluntariness an appropriate antecedent to the human intention to use based upon past research in the field of IS technology use (Moore and Benbasat, 1991). Voluntariness survey questions determined if the respondent's perception of not being required to use the technology impacted their behavioral intention to use.

The Non-User group's perception of potential use as a choice (or the idea that it is *voluntary*) influenced their behavioral intention, and the hypothesized relationship was supported. Voluntariness is a thought-provoking construct since the perspective of a consumer would differ from that of an employee. If an employee is required to complete certain tasks and multiple workplace tools are available to complete the job, offering the employee a sense of voluntariness might be an influence upon the individual's thoughts and feelings about behavioral intention.

However, if only one protocol is applied in completion of the work, then voluntariness is irrelevant. Businesses which seek to change the behavior of an entire organization should focus upon how to transition the majority of employees into ITC Users. Organizations can transition their approved workplace tools making ITC the only option (in which case no mobile devices are purchased for new hires), and eventually Non-Users of the service will cease to exist.

Contributions

The primary contribution of this research was the continued probing into the actual use behaviors within the field of Information Systems. The project facilitated the research stream by leveraging service quality perceptions as a promoter of behavioral intention, and by identifying discrete use as a dependent variable within the IT Consumerization phenomenon. The application of the Theory of Planned Behavior as the framework assured that the attitudinal intentions were clearly scoped; therefore, related items which represented perceived behavioral control stayed true to the definitions of the conceptual model.

Many companies are invested in the idea that technology solves problems, improves productivity, and is a catalyst for innovation. This research provided practitioners with continued support for the promotion of actual use behaviors with information systems. The future workforce will be challenged in relation to the continued use, expanded use, or the application of alternate approaches to the use of technology systems and services. Understanding how to drive the use behaviors of technology is critical to a return on an investment in a technology innovation. Timing is

critical for implementing the service or solution. Research into actual use behaviors is therefore imperative for both academics and practitioners.

Limitations and Future Research

Limitations. The limitations of this research include the lack of generalizability and sample size. The objective of this research was to learn more about "consumer-based" influences on employee-based decisions. Due to the use of a single industry sample, a limitation within the study is the lack of generalizability across other industries. The User and Non-User Groups were not only from a single industry but were also focused on one particular work role and thus did not include a well-distributed age range. Expanding the study across industries, age ranges, and work roles would allow for further understanding of the employees' consumer perceptions which influence human intentions toward ITC use. The study also had a limitation related to sample size. Some relationships were on the cusp of being statistically supported; therefore, any opportunity for further exploration with a larger sample would be appropriate.

*Future Research***.** The potential for future academic research opportunities from this study are focused upon three areas. First, future research is needed in the development of a greater understanding of demographic influences upon employee intention and actual use of an enterprise technology innovation. Second, consideration should be given to companies outside of technology-based organizations, and specifically to teams which support business administration, sales, or financial practices. Finally, the broadening of the IT Consumerization stream of research into other emerging corporate technology innovations where age demographics, as well as personal interest toward innovation might influence service subscribership and continued use.

An aging workforce may perceive technology use differently than that comprised of a younger generation, and may have a different expectation of the tools and services provided by the employer. The current study included respondents who were mature in age and their years of experience. More research is needed to determine the effects of an aging workforce where technologies are emerging quickly and growing in complexity.

Understanding more about personality perceptions, i.e., personal innovativeness, might offer additional insights into initial use and actual use behaviors. Furthermore, research about Non-Users and the possibility that other motivational factors such as fear of failure could be an opportunity to learn more about intentions to use. Lastly, for those that engage in early use and continued use of innovations to complete work tasks, researchers can begin to design these motivational conditions into the research stream. Future research can begin to probe technology adoption from the lens of motivational theory identifying potential influences impacting the undecided non-users, initial users, continuous users, and "mindful" use behaviors.

Other future research opportunities include an extended assessment of behavioral intentions of the Non-User and User in association with other emerging technologies. The theoretical framework, which merges consumer-based perception with employee-based decisions, might also apply to future studies on the use of emerging technologies. Learning how the uncertainty of the unknowns for the various user groups might influence the individual beliefs leading to human intentions would help practitioners to continue growing subscribership.

Closing Remarks

The goal of the research project was to uncover new precursors which impact human intentions to use ITC Consumerization Services. The analysis accentuated the differences between the groups and sought the determination of influential factors toward intention to use. All the respondents indicated that availability of quality technology service support (service quality) for IT Consumerization Services was an influence upon human intentions toward use. Future research for other emerging innovations should consider this perception for the growth of subscribership in the organization, as well as the need to build a community of actual users. The service quality construct may also help to identify other potential opportunities for both academics and practitioners. The results of this study continue the forward momentum associated with the ITC phenomenon, provide added exposure to actual use in the IS research work stream, and suggest a new approach for promoting employee-based technology services to business communities.

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APPENDICES

Appendix A: Construct Definitions, Instructions, and Scale Items

Definition: IT Consumerization is the use of a personal device to complete employee work-related tasks including activities which create, update, and manage corporate data. A personal device can be your smartphone, tablet, or laptop.

Instructions: When responding to the following question related to your work tasks keep in mind those activities beyond emailing or answering a phone call. Consider activities such as updating a timecard or submitting an expense report via your personal device. Another example might be reviewing a financial document or a procurement request, video conferencing, or updating a project schedule in a share point.

Please respond to the following questions using the following scale. Items will be presented one at a time, please respond to each.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Performance Improvement

Performance improvement is the belief that work tasks will be completed more effectively and with greater efficiency through the use of IT Consumerization services on their personal device.

Question: If I use other technologies than those provided by the company to perform work tasks

	1	2	3	4	5	6	7
PI1: …my performance will improve							
PI2: …my productivity will improve							
PI3: …I will work faster							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Privacy Concerns

Privacy Concerns: Employee belief that private information on their personal device will be used inappropriately by the employer when IT Consumerization services are used.

Privacy Concerns	1	2	3	4	5	6	7
PC1…I would be concerned that my employer is collecting too much information about me (social networks, private emails, and private photos).							
PC2…I would be concerned my personal information would be misused.							
PC3… I would be concerned about my privacy/ security.							
PC4…I would have doubt about how well my privacy is protected.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Consumerization Behavior of Co-Workers

Consumerization Behavior of Co-Workers: Directed by the employee's peer group perception, the pressure or persuasion experienced by the employee to use technology Consumerization services on a personal device.

Consumerization Behaviors of Co-Workers	1	2	3	4	5	6	7
CBCW1: Co-workers who are important to me think that I should use my personal technologies to perform work-related tasks for my company.							
CBCW2: People who influence my behavior think I should use my personal technologies to perform work-related tasks for my company.							

CBCW3: People whose opinions I value prefer that I use my personal technologies to perform work-related tasks for my company.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Personal Innovativeness in Information Technology

Personal Innovativeness of Information Technology is the willingness of an employee to try and out and adopt technology innovations in the early stages of availability.

Personal Innovativeness	1	2	3	4	5	6	7
PIIT1: If I heard about a new technology. I would look for ways to technologies experiment with it.							
PIIT2: Among my peers, I am usually the first to try out new information.							
PIIT3: In general, I am hesitant to try out new technologies. *(reverse code)							
PIIT4: I like to experiment with new information technologies.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Technology Support Empathy

Tech Support Empathy as a service quality that assures all devices will be supported by the company implementing the IT Consumerization service. Technical support is perceived as acceptable when users experience empathy when contacting the IT Department for support.

Technology Support Empathy	1	2	3	4	5	6	7
SQE1: The IT Department will give me individual attention as needed during the use of the IT Consumerization Service at my company.							
SQE2: The IT Department will have my best interests in mind during the use of the IT Consumerization service at my company.							
SQE3: The IT Department will have a mechanism to provide personal attention as needed during the use of the IT Consumerization service at my company.							
SQE4: The IT Department will understand my specific needs when necessary regarding the use of the IT Consumerization service at my company.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Technology Support Responsiveness

Tech Support Responsiveness as a service quality that assures all devices will be supported by the company implementing the IT Consumerization service. Technical

support is perceived as acceptable when users experience responsiveness when contacting the IT Department for support.

Technology Support Responsiveness	1	2	3	4	5	6	7
SQR1: I believe the IT Department will respond to my needs during use of the IT Consumerization services in my company.							
SQR2: In the case of any problem, I think the IT Department would give me prompt service with IT Consumerization support.							
SQR3: The IT Department would address any concerns that I would have regarding IT Consumerization services.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Voluntariness

Voluntariness: Use of the IT Consumerization is voluntary where employees have the option to participate which in turn increases behavioral intention to use.

Voluntariness	1	2	3	4	5	6	7
VOL1: My use of an IT Consumerization services is voluntary (as opposed to being required by my supervisor or job description).							
VOL2: My boss does not require me to use IT Consumerization services to complete my required work tasks.							
VOL3: Although it might be easy to use,							

using an IT Consumerization services on my personal device is certainly not compulsory in my job.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Attitude toward the Behavioral Intention

Attitude toward the Behavioral Intention: Generated by related norms, perceived behavioral controls, and beliefs, the user's attitude is developed in relation to IT Consumerization service availability in the work place.

The use of my personally owned device for working purposes is…

Attitude toward the Behavioral Intention	1	2	3	4	5	6	7
ATT1….good							
ATT2….wise							
ATT3….positive							
ATT4…favorable							
ATT5…beneficial							
ATT6…I like the idea of using my personal mobile device for working purposes.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Behavioral Intention to Use

Behavioral intention to use: Developed from the user's attitudes, behavioral intention is the intent to use the IT Consumerization service on a personal device(s) to complete work-related tasks.

Behavioral Intention to Use	1	2	3	4	5	6	7
BITU1: If the IT Consumerization service is offered, I intend to use the service.							
BITU2: If the IT Consumerization service is offered, I predict I would use the service.							
BITU3: If the IT Consumerization service is offered, I plan to use the service.							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Actual Use

Actual Use: Driven by the behavioral intention of the user, use of the IT Consumerization services on a personal device (self-report) in the work place to regularly complete enterprise application tasks (nature of use).

Actual Use	1	2	3	4	5	6	7
AU1-My use of a personal device to perform company related tasks is more sophisticated than others							
AU2-I use features in my personal device to perform company related tasks to do things differently than others.							

AU3-I try new features in my personal device to perform company related tasks to make me more efficient than others.							
AU4-I explore how I can use the IT Consumerization service to manage my work related tasks							
AU5-I explore new uses of the IT Consumerization service to complete my work related tasks							

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Questions about the Respondents

Birth Year	

Gender	M or F
Male / Female	

Employee Role	Yes/No
College Worker	
Individual Performer	
Team Leader	
Project Manager	
Sales Representative	
Manager	

Device/Technology Used	Yes/No
Tablet	
Smartphone	
Laptop	

Enterprise Systems/Application Used via IT Consumerization Service	Yes/No
ERP = Time Cards, Expense Report	
KMS= Share Point/Doc Management	
CRM=Sale Force, etc.	

Education Qualification	Yes/No
High School	
Associate Degree	
Bachelors	
Higher Level Academic Degrees	
Specialty/Industry Related Certification	

Years with Current Employer	
Years in the IT Industry	

Appendix B: Heterotrait-Monotrait Ratio Analysis

As support for discriminant validity within the research model's design, an additional assessment of Heterotrait-Monotrait (HTMT) Ratio analysis is provided as an extension of the Chin (2010) discussion provided in Chapter 4. Using Smart-PLS3, both the User and Non-User data sets were evaluated using the HTMT analysis tool. The analysis output is provided below, where both outputs are acceptable with no values greater than .90 (Gold, Malhotra, and Segars, 2001). The more conservative HTMT acceptance criterion is when scores are < .85 (Clark and Watson, 1995). This was the predominant condition with only one construct in the User Group data identified as meeting the more lenient requirement of < .90.

Table 32: Non-User Group HTMT [85]

	ATT	BITU	HOC-SQ	Interactio	NEGB	PIIT	POSB	SNM	SQE	SQR
ATT										
BITU	0.820									
HOC-SQ	0.403	0.465								
Interactio	0.167	0.107	0.152							
NEGB	0.485	0.273	0.249	0.386						
PIIT	0.316	0.387	0.147	0.209	0.104					
POSB	0.726	0.742	0.353	0.128	0.214	0.541				
SNM	0.582	0.617	0.474	0.133	0.098	0.376	0.670			
SQE	0.431	0.515	1.114	0.131	0.299	0.146	0.376	0.467		
SQR	0.366	0.398	1.115	0.180	0.181	0.150	0.322	0.483	1.000	
VOL	0.210	0.306	0.138	0.159	0.272	0.397	0.225	0.142	0.151	0.120

Table 33: User Group $HTMT_{85}$/$HTMT_{90}$

	ATT	AU	BITU	HOC-SQ	Interact	NEGB	PIIT	POSB	SNM	SQE	SQR
ATT											
AU	0.661										
BITU	0.894	0.849									
HOC-SQ	0.372	0.616	0.587								
Interactio	0.217	0.179	0.173	0.221							
NEGB	0.179	0.236	0.293	0.366	0.232						
PIIT	0.189	0.348	0.251	0.320	0.363	0.180					
POSB	0.588	0.584	0.519	0.327	0.150	0.120	0.342				
SNM	0.457	0.594	0.416	0.343	0.162	0.141	0.139	0.353			
SQE	0.326	0.614	0.531	1.110	0.225	0.340	0.315	0.339	0.346		
SQR	0.451	0.643	0.688	1.137	0.223	0.416	0.341	0.323	0.354	1.060	
VOL	0.263	0.478	0.320	0.212	0.247	0.234	0.271	0.256	0.247	0.267	0.144

Based upon the theoretical framework of the research design, it is not unusual for the Attitude and the Behavioral intentions toward use to have a strong relationship. Because this design included the assessment of beliefs it would be reasonable that both constructs would be deemed appropriate for research into technology use (IT Consumerization services) in the workplace. Furthermore, those constructs positioned as first order constructs and as part of the higher order model representing Service Quality, are not subject to the evaluation of HTMT Ratio analysis. Additionally, bootstrapping was performed as one additional check referencing the HTMT inference values for both data sets. No scores greater than 1.00 were identified in the final check, therefore providing additional support of discriminant validity (Table 34 and Table 35).

Table 34: Non-User Group HTMT $_{inference}$

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
ATT -> BITU	0.575	0.601	0.025	0.454	0.825
HOC-SQ -> BITU	0.126	0.103	-0.023	-0.110	0.196
HOC-SQ -> SQE	0.964	0.966	0.001	0.953	0.981
HOC-SQ -> SQR	0.939	0.940	0.000	0.909	0.965
Interaction Effect: PIIT	-0.129	-0.074	0.055	-0.246	0.196
NEGB -> ATT	-0.344	-0.339	0.005	-0.503	-0.172
PIIT -> BITU	0.054	0.038	-0.015	-0.154	0.195
POSB -> ATT	0.582	0.594	0.012	0.476	0.751
SNM -> BITU	0.195	0.208	0.013	0.043	0.400
VOL -> BITU	0.137	0.146	0.009	-0.041	0.345

Table 35: User Group HTMT $_{inference}$

	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
ATT -> BITU	0.637	0.633	-0.004	0.400	0.848
BITU -> AU	0.624	0.643	0.018	0.559	0.790
HOC-SQ -> BITU	0.127	0.139	0.011	-0.036	0.363
HOC-SQ -> SQE	0.974	0.974	0.000	0.960	0.986
HOC-SQ -> SQR	0.955	0.957	0.001	0.944	0.975
Interaction Effect: PIIT	0.164	0.099	-0.064	-0.265	0.304
NEGB -> ATT	-0.291	-0.299	-0.008	-0.509	-0.127
PIIT -> BITU	0.154	0.115	-0.038	-0.170	0.237
POSB -> ATT	0.493	0.499	0.006	0.345	0.661
SNM -> BITU	-0.025	-0.034	-0.010	-0.249	0.104
VOL -> BITU	-0.069	-0.089	-0.019	-0.297	0.030

Conditions where 2nd Order constructs are positioned in the model are not relevant to HTMT analysis and therefore are not called out as a condition which impairs the results of this assessment. All other values noted in the upper end of the confidence interval (97.5%) do not exceed the 1.00 criterion and are therefore deemed acceptable as further support of discriminant validity (Henseler, Ringle, and Sarstedt (2015).

Appendix C: PLS MGA

The research data set consisted of two groups Users and Non-User with the groupings determined by their responses to select questions in the survey. The questions isolated Users based upon their ability to identify both the technology hardware and the technology application used with IT Consumerization service. The two separate groups in the study could be described by the term Observed Heterogeneity, meaning the respondents had been previously flagged within the data set as being different (Hair et al., 2014). As a follow-up assessment regarding group differences and whether the two groups vary in responses among the different construct relationships as suggested in the model, another statistical method was applied. Using SmartPLS3, the groups were evaluated using the MGA-PLS assessment. The confidence intervals are a means to assess the scores and the ranges that most scores fit into based upon the linear relationships found for each path. By comparing the confidence interval range for each relationship between each group, one can determine if the respondents in each group have a tendency to respond in a range that is not typical for the other group in the data set. The results indicated no overlap in confidence intervals between groups for each of the path model relationships, thereby providing support for the acknowledgement that the groups are different beyond the selection of hardware and the applications used with the IT Consumerization service (see Table 36).

Table 36: Confidence Intervals (Bias Corrected)

	Path Coefficients (Non-Users)	2.5% (Non-Users)	97.5% (Non Users)	Path Coefficients (Users)	2.5% (Users)	97.5% (Users)
2ND ORD -> BITU	0.148	-0.070	-0.115	0.129	0.251	0.320
ATT -> BITU	0.635	0.530	0.272	0.547	0.800	0.686
BITU -> AU	0.618	0.503	0.642	0.693	0.754	0.815
NEGB -> ATT	-0.284	-0.478	-0.569	-0.349	-0.122	-0.218
PIIT -> BITU	0.031	-0.137	-0.018	0.137	0.169	0.278
POSB -> ATT	0.594	0.429	0.320	0.477	0.788	0.639
SNM -> BITU	0.138	0.030	-0.023	0.158	0.351	0.315
VOL -> BITU	-0.037	-0.205	-0.286	-0.028	0.081	0.102